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LEVELS OF NURSING CARE: A COMPARATIVE STATISTICAL ANALYSIS

by

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "Levels of Nursing Care: A Comparative Statistical Analysis," submitted by Evelyn M. Dragojevich in partial fulfillment of the requirements for the degree of Master of Health Services Administration.

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ABSTRACT

In this study the investigator undertook to describe and compare the simultaneous application of non-parametric and parametric statistical techniques to Levels of Care data in relation to the variables of: sex of patients, type of nursing unit, specific type of nursing units, nursing units with and without nursing students, age of patients, accommodation occupied, and marital status of patients. The central purpose was to evolve a valid method of statistical analysis for the treatment of Levels of Care data. The approach used was that of a descriptive comparative survey, and the method employed was that of measuring. The nursing activity required by the patient was the criterion used to objectively measure "Levels of Care." The scores thus obtained provided a numerical basis for the comparative statistical analysis in terms of the ten research hypotheses, the data collection periods, and the elements of direct nursing care.

On the basis of the findings, the first central conclusion was that analysis of Levels of Care data is best achieved through the use of non-parametric statistical techniques, particularly ordinal techniques. The investigator outlined the conditions which must be met in relation to the specific tests recommended. The second central conclusion was that the practical applications of statistical analyses of

Levels of Care data could be greatly enhanced by the giving of detailed attention to the "Elements" of direct nursing care because that data would seem to provide more extensive and precise guidelines to patient care needs and resource allocation.

The recommendations arising from this study embody the use of ordinal statistical techniques, the use of "Elements" of direct nursing care data along with Levels of Care data for such analyses, the needs for future research related to Levels of Care data, and the need for evolving cooperative approaches to electronic processing of Levels of Care data.

DEDICATION

To my dear Mother and young Son, whose patience, endurance, understanding, constant encouragement and support, has made the pursuit of my studies possible.

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Acknowledgement and appreciation are conveyed to the numerous unidentified patients and nurses who, directly or indirectly, made this study a possibility.

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CHAPTER I

INTRODUCTION

One of the most pervasive themes characterizing the recent Task Force Reports is the importance of evolving systematic ways and means of identifying health care system needs.[1] Traditionally, nursing care needs of patients have, at best, been established on the basis of average daily census and type of clinical service, e.g. obstetrics, psychiatry. More recently, the "Levels of Care" approach has been developed, an approach which incorporates not only the above two factors but, as well, considers variations within the clinical services and the fluctuating nursing care requirement of individual patients. This study represents an attempt to examine and, hopefully, improve upon some of the "ways and means" of analysing data relating to nursing care needs of hospitalized patients, more specifically, data relating to "Levels of Care."

The general approach employed in this study is that of measuring "Levels of Care" using nursing care requirements of the patients as the main criterion, in order to facilitate comparisons within and amongst groups of patients.

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[1] Task Force Reports on the Cost of Health Services in Canada. Joseph W. Willard, chairman. 3 vols.; Ottawa, Canada: Queen's Printer, 1969, e.g., Vol. 2, pp. 269, 272, 307.

In this chapter the investigator outlines more specifically the focus of the study, the assumptions and limitations, definitions, hypotheses and, finally the overall sequence of analysis. We will now turn to the first of these, the focus, discussing the researcher's task, the research question, and outlining the need for the study.

FOCUS OF THE STUDY

THE RESEARCHER'S TASK

The research task around which this study is centered is that of describing and comparing the application of nominal, ordinal and interval statistical techniques to Levels of Care data, using selected variables.

THE RESEARCH QUESTION

One of the main objectives, usually stated as the primary goal, of general acute hospitals is that of "patient care." The recipient of this care, the patient, is a "delicate variable," and a sensitive instrument is required to evaluate the kinds and amounts of nursing care he requires. The Levels of Care approach relates nursing care requirements to the nursing activities which should be performed in order to meet the patient's nursing care needs.

The basic data-gathering questions posed in this study are: Do men and women require different levels of nursing care? If so, what elements are peculiar to each sex? What are the numerical patterns of the assignment of

patients to the differing Levels of Care? Are differences in Levels of Care patterns related to marital status? If so, in what way(s)? Does the age of the patient alter the Level of Care assignment? Do medical patients differ from surgical patients in patterns of nursing care required? Do those nursing units which are used as clinical laboratories for educational purposes differ from other nursing units in their patterns of Levels of Care? Do patients with different types of accommodation, (e.g. semi-private accommodation) occupy specific patterns in Levels of Care?

The above questions are not "new" or original in that they have been posed many times before by both researchers and practitioners; the focus of this study lies not in such questions per se but upon the comparative statistical treatment of data related to these questions. Or, put another way, it is an attempt to ask the research question, "Do differing statistical analytical treatments of data related to Levels of Care lead us to differing responses to the above data-gathering questions?"

NEED FOR THE STUDY

To date, the statistical techniques applied to Levels of Care data have been largely interval in nature. The application of "Newman Keuls" comparison between ordered means to "Levels of Care" data and the use of regression analysis in

nursing care timing studies are two such examples.[1] While "levels" in both ordinal and interval measurement problems implies an underlying continuum, it would seem tenuous to assume that the intervals between the "levels" in Levels of Care data are equidistant, and the questioning of the appropriatness of parametric techniques therefore arises. The unique contribution of this study lies in the simultaneous nominal, ordinal and interval treatment of Levels of Care data in relation to selected variables for the central purpose of evolving a valid method of statistical analysis for this type of data.

Ultimately, the "validity" of any statistical method for treating Levels of Care data lies in the question, does the method facilitate improvement of patient care? Such validation of a method is beyond the scope of this study; instead, the chief criteria against which the validity of the method evolved are limited to the face and content levels. The initial criterion is, does the method meet the statistical assumptions underlying the data? If it does, then the question of the extent to which the method comprises a practical basis for decision-making about nursing practice then becomes relevant. "Practicality" must be judged both in terms of the production of data *per se*, and in terms of the

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[1]This information was reported to the investigator in a telephone conversation April 1, 1971, with Mr. Brian Chalmers, who acted as a statistical consultant on the *Timing Studies* project referred to on page 7.

application of the findings to decisions about nursing practice.

In the former case, the practicality of analysing data must be determined in relation to the expertise required, time factors, and economic considerations. In the latter case, a method would be "practical" only if it produces data which facilitates objective and discriminating judgements about nursing practice, directly or indirectly, in relation to Levels of Care, e.g. the determination of nursing staffing requirements in relation to differing "mixes" of patients.

ASSUMPTIONS AND LIMITATIONS

ASSUMPTIONS[1]

The central methodological assumption underlying the study is that the Level of Care Assessment Return form, revised by the National Department of Health and Welfare Nursing Consultants, and adapted from Dr. Asa MacDonell's Level of Care Proforma is a reliable and valid instrument for measuring levels of [nursing] care of medical and

[1]The statistical assumptions of data analysis are discussed in Chapter III, "Methodology," pp. 79-82.

surgical patients in general acute hospitals.[1]

LIMITATIONS

This study is limited to the patients on four surgical and four medical nursing units in one general acute hospital. No attempt is made to verify the representativeness of the patients on these units vis-à-vis those on medical and surgical units in other hospitals, nor those in the total acute general hospital population as such. Further, the study is confined to nursing care required by patients as measured by the "Levels of Care" approach, and does not ascertain whether or not those nursing requirements were met.

Although applicability of the specific "Levels of Care" findings, such as the distribution of patients in the various Levels is concerned, is limited to the population sampled, the data collection procedures and statistical techniques utilized here are applicable beyond the population sampled to the universe of medical and surgical patients in general acute hospitals in Canada.

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[1]In the use of this form, "no [subjective] observer judgement decisions need be made regarding the severity of the patient's illness, the degree of his disability, or the determination of his care requirements. Consequently, an objective assessment, divorced as it is from observer decision, is obtained." See J.A.K. MacDonell, M.D., and G.B. Murray, B.S.A., M.S. "An Index of Care," Medical Services Journal, XXI (September, 1965), p. 507. The foregoing quote attests to this instrument's reliability. So far as validity is concerned, while the investigator is not assuming that it is necessarily an "ideal" instrument, it would appear to have face and content validity and, further, it has been tested extensively in the field, the items having been weighted in relation to nurse staffing requirements.

DEFINITIONS

BASIC DEFINITIONS[1]

The following is a summary of terms used in this study:

1. LEVELS OF NURSING CARE: a descriptive term used to classify patients. Each "level" is a measure of nursing requirements of the patient. The relationship between "Level of Care" and "Nursing Care Requirements" are as follows:[2]

*LEVEL [OF CARE]	*NURSING CARE REQUIREMENT
I	Minimal amount of direct nursing care
II	Moderate amount of direct nursing care
III	Maximum amount of direct nursing care

2. *DIRECT NURSING CARE: "any nursing activity in which direct contact by the nursing staff with the patient is involved."

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[1]All definitions marked with an asterik (*) have been derived from J.A.K. MacDonell and G.B. Murray, "An Index of Care," pp. 499-501; and J.A.K. MacDonell; Unnur, Brown; and Barbara Johannson, Timing Studies in Relation to Categories of Hospital Patients. Winnipeg: Deer Lodge Hospital, n.d. (hereinafter referred to as MacDonell et al, "Timing Studies"), pp. 1-4. Some additional definitions deemed useful by the investigator are also included; the words with square brackets [] denote additions made by the investigator for purposes of this study.

[2]MacDonell and Murray, "An Index of Care," p. 504.

3. *CLINICAL MONITORING - A: "the recorded observation and/ or measurement of the patient's vital processes such as temperature, pulse, respiration, blood pressure, and consciousness." This element is referred to as "A" in the definitions of care categories which follow. [Required continual observation].[1]

4. *TECHNICAL NURSING - B: "the treatment procedures [required by the patient] usually carried out by nursing staff." [This includes such things as medications, intravenous infusions, dressing, and other treatments or required supportive measures]. This element is referred to as "B" in the care categories described.

5. *NON-TECHNICAL (BASIC) NURSING - C: " the personal attention provided to patients by nursing staff which relates to their comfort and well-being (feeding, hygiene, elimination of waste, etc.)" This element is designated as "C" in the definitions of care categories, and on the assessment form.

6. *CARE CATEGORY: a descriptive term used to describe the various types of care in each level [required][2] by patients in hospital. E.g. Level III patients may be

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[1] Ibid., p. 499. Definitions 3, 4, and 5 are considered as defining the three "elements of direct nursing care" hereinafter referred to as such.

[2] MacDonell et al, Timing Studies, pp.1-4, define each "care category" in terms of the care provided, whereas this study assumes each care category in terms of required care.

either in the acute <u>or</u> the intensive care category.[1]

7. NEEDS OF THE PATIENT[2]: nursing care requirements of individual patients in each of the elements of direct nursing care A, B, and C cited above. It does not refer to psycho-social measures <u>per se</u> related to patient care, but rather to the direct nursing care required, as listed on the assessment form used to classify patients into Levels of Care.

8. NURSING UNIT[3]: a specific spacial area with a specific predetermined bed capacity.

9. MEDICAL-NURSING UNIT: a nursing unit in which medical patients are housed. If specified by clinical service, "ward" is considered synonymous with "unit," otherwise "ward" refers to a type of accommodation on the nursing unit, such as a 4 bed ward.

10. SURGICAL-NURSING UNIT: a nursing unit in which surgical patients are housed.

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[1]See pp.10-12 for definitions of each type of care category.

[2]To be used interchangeably with the "patient's needs."

[3]In the statistical analyses "WARD TYPE" refers to nursing units.

DEFINITIONS OF CARE CATEGORIES[1]

Each Level of Care is associated with a category of care, and the following definitions describe the various categories associated with each level. The elements of direct nursing care, Clinical Monitoring (A), Technical Nursing (B), and Non-Technical (Basic) Nursing (C), are referred to in each definition by letter.[2]

1. INVESTIGATIVE CARE - care [required] by patient in hospital for "investigative procedures," e.g., X-Ray, Laboratory Tests. His [requirement] for A, B, and C is negligible.
2. CONVALESCENT CARE - care [required] by patient "in latter stages of hospitalization," who is progressing very satisfactorily and whose "clinical condition has been stabilized." He is almost ready for discharge and [requirement] for A, B, and C is also negligible.
3. INTERMEDIATE CARE - care [required] by patient who is "ill or in post-surgical period," his vital processes are stable but he is still in need of "treatments and supportive measures" during this recovery phase (of

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[1]These definitions are adopted from those used by MacDonell et al, Timing Studies, pp.1 - 4 , with changes considered necessary for the purposes of this study.

[2]It is useful to remember that in this study it is assumed that measurement of care is that care which is required and not any measure of provision of care. The basic ideas for the definitions of these categories are the same as those used previously and those unchanged are marked by an asterik (*).

the various medical or surgical conditions). His [requirement] for A, B, and C are moderate and duration of hospital stay in this study is considered as less than 30 days.

4. ACUTE CARE - care [required] by patient who is quite ill, in an acute phase of his illness and whose vital processes are still in an unstable state. His requirement for A, B, and C are high and frequent.
5. INTENSE CARE - care [required] by patient who is in critical phase of his illness and whose vital signs are in an "unstable and precarious state." His requirements for A, B, and C are continuous with A being the most essential from a clinical point of view.
6. EXTENDED TREATMENT CARE - care [required] by patient with a chronic illness or one who has passed the stage "when medical or nursing care will provide for rapid improvement," and requires care over an extended period of time. He requires a moderate amount of B and a great deal of C and the need for A is negligible. His duration of hospital stay for this study is 30 days and over and is a Level II patient.
7. *DEPENDENT NURSING CARE - "is that nursing care carried out upon the instruction (written, verbal, or implied) by the physician." This relates to a larger degree to B, and to a lesser degree to A.

8. *INDEPENDENT NURSING CARE - "is the observation and assessment of, and the provision for the physical, personal, and psychological needs of the patient."

HYPOTHESES[1]

In general, the hypotheses were developed on the basis of literature relating to Levels of Care and to psycho-sociological perspectives relevant to the assessment of nursing care needs. The specific rationale underlying the selection of the following hypotheses is explicated in the next chapter "A Framework for the Development of the Research Methodology."[2]

SEX OF THE PATIENTS

H_1: Female patients differ from the male patients in their assignment to Levels of Care.

TYPE OF NURSING UNIT

H_2: Patients on medical nursing units differ from those on surgical nursing units in their assignment to Levels of Care.

H_3: The assignment to Levels of Care differs amongst medical nursing units.

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[1]Hypotheses are stated in null form in Chapter III, "Methodology," in order to facilitate their statistical analytical treatment.

[2]The rationale is discussed under the same subheadings, in Chapter II, pp. 40-52.

H_4: The assignment to Levels of Care differ amongst surgical nursing units.

NURSING UNITS WITH OR WITHOUT NURSING STUDENTS

H_5: The assignment to Levels of Care differs between nursing units used for nursing student clinical experience and on those which are not.

ACCOMMODATION OCCUPIED

H_6: The assignment to Levels of Care differs on the basis of types of accommodation occupied by patients.

AGE OF PATIENTS

H_7: The assignment to Levels of Care differs according to the age of patients.

MARITAL STATUS OF PATIENTS

H_8: The assignment to Levels of Care differs according to the marital status of patients.

MARITAL STATUS, SEX, AND AGE

H_9: The assignment to Levels of Care differs on the basis of marital status, and sex of patients.

H_{10}: The assignment to Levels of Care differs on the basis of marital status, sex, and age of patients.

SEQUENCE OF ANALYSIS

The development of this study can be thought of as constituting four major phases. Chapter II constitutes a conceptual framework for the development of the methodology and the research hypotheses; the specific methodology is

described in Chapter III; findings and the analysis of data are presented in Chapter IV; and conclusions are drawn and recommendations made in the final chapter.

CHAPTER II

A CONCEPTUAL FRAMEWORK FOR THE DEVELOPMENT OF THE RESEARCH METHODOLOGY

There would appear to be a paucity of literature specifically related to comparative statistical analysis of Levels of Care data. The general literature on factors which alter patient care requirements does, however, provide a relevant basis for evolving a framework for the analysis of Levels of Care data.

This chapter is ordered to fulfill two purposes: firstly, to create a "lens" through which the development of the Levels of Care approach may be viewed; and, secondly, to provide a rationale for the research hypotheses. To accomplish the first purpose, we will outline the antecedents to the Levels of Care approach, discuss Levels of Care *per se*, and then present considerations regarding the statistical analysis of Levels of Care data. The second purpose will be achieved through viewing related social, medical and nursing literature in order to provide a perspective for the selection of the variables employed in this study.

ANTECEDENTS TO THE LEVELS OF CARE APPROACH

Assessment of the care requirements of "hospitalized patients" is a part of the larger question of identifying health care needs and improving the utilization of resources.

It is particularly pertinent to the question of nursing unit staffing requirements. In regard to these antecedents we will first discuss the "average daily census" approach, "types of patients" approach, and "patients needs" approach. Hospital and community factors which are considered to influence the care required by and given to patients will then be discussed briefly, in order to complete the junction from the antecedents to the Levels of Care approach.

AVERAGE DAILY CENSUS APPROACH

Some of the most common approaches to assessing patient care requirements existing,use as a standard the number of nurses needed for a "given" number of patients: or at some times care requirement differences are calculated on the basis of the type of clinical service to which patients are assigned, e.g. medical, surgical.[1] Oftentimes these ratios are expressed in average hours of nursing care needed per medical or surgical patient during 24 hours, expressed as e.g. 3.4 and 3.5 hours, respectively.[2] Levine et al, concluded from their study of U.S. hospitals, reported in 1961, that the common denominator or standard base was "patient census without consideration of other factors that could

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[1]Eugene Levine, Stanley Siegel, and Joseph De La Duente, "Diversity of Nurse Staffing Among General Hospitals," Hospitals J.A.H.A. 35 (July 1, 1961), p. 42.

[2]American Hospital Association and National League of Nursing Education, Hospital Nursing Service Manual (New York: National League of Nursing Education, 1950), p. 30. Hereinafter referred to as"HNS Manual, 1950."

influence staffing requirements."[1] They developed six ratios, shown by a Table,[2] where ratios 1 through 4 show relationship between the number of bedside nursing personnel and the number of patients. The findings of Drosness and others suggest that concern with daily census by the individual hospital, and collection and analysis of census data will "provide the best estimate of bed capacity."[3] For most administrators, the "primary indicator of demand is the inpatient census - the number of patients occupying beds in the hospital nursing units."[4] Census variability, which may be difficult to predict, stems from the probabilistic nature of illness itself which can be seen as the motivator of demand for the services and resources provided by hospitals.[5] However, "if there is

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[1]Levine et al, p. 42.

[2]Levine et al, p. 43. Ratios shown were drawn up from data provided by a survey of 5399 short-term general hospitals and allied special hospitals in Continental United States listed in Part 2 of August 1, 1958, Guide Issue of Hospitals, J.A.H.A., pp. 354-362.

[3]Daniel L. Drosness, Larry S. Dean, Jerome W. Lubin, and Nancy Ribak, "Uses of Daily Census in Determining Efficiency of Units," 2 parts, Hospital J.A.H.A. 41 Pt. 1 (December 1, 1967), p. 106. Pt. 2 (December 16, 1967); hereinafter referred to as "Drosness et al part 1 or 2."

[4]Harvey Wolfe, and John P. Young, "Staffing the Nursing Unit," 2 Parts, Nursing Research, 14, Part 1 "Controlled Variable Staffing," (Summer, 1965) 236-243, Part 2 "The Multiple Assignment Technique," (Fall, 1965) 299-303. Hereinafter referred to as "Wolfe and Young Part 1 or 2." This quote is from Wolfe and Young, Part 1, p. 236.

[5]Ibid.

no other method to evaluate patient illness, census is the primary indice," and can be used in a preliminary analysis by comparison "of identical days."[1] As a prerequisite for any final analysis to establish the need for a program to effectively utilize and control nursing personnel, information regarding severity of illness within the patient census and other conditions pertaining to the particular hospital are most important.[2]

TYPES OF PATIENTS APPROACH

An extension of the average daily census approach is that which includes the computation of overall occupancy by each major clinical service or department. Such an approach considers different types of treatments based on the clinical specialty. Type of clinical services analysis is often related to occupancy data in order to provide information that would allow for more control over the demands made by higher occupancy on the various clinical services. Specialized units, such as pediatrics, obstetrics, coronary care units, are areas where occupancy control is difficult and increasing the occupancy rate by reducing the capacity provides few tangible results.[3] In the "types of patients" approach the

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[1]James K. McNally, "Flexible Staffing - The Key to Better Utilization of Nursing Personnel," Hospital Financial Management 24 (February, 1970), p. 6.

[2]Ibid., p. 6.

[3]Morris London, and Robert M. Sigmond, "Small Specialized Units Lower Occupancy," The Modern Hospital 96 (May, 1961), pp. 95, 97.

nursing care is seen to differ in relation to occupancy rate, and differences in the treatments required are considered related only to the type of clinical service. The fallacy of this approach is that two "equivalent" nursing units may have the same occupancy levels, but one may have a large portion of critically-ill patients whereas the other may have a large portion of noncritically ill patients, and thus different nursing care requirements.[1]

PATIENT'S NEEDS APPROACH

Daily patient census, measured over a period of time in order to estimate care "needs" and the nursing personnel required to cover these needs may in the past, have proven to be a useful approach, but it does not consider the variability of individual patients needs nor those of nursing units.[2] The point to be emphasized by Wolfe and Young is that "the amount of nursing care required on a nursing unit is not determined merely by the number of patients on the unit" and an essential requirement is based on a "realistic evaluation of patient needs rather than patient census."[3] It is important to determine how classes or groups of patients vary within the census and this "in conjunction with average times required" then permit estimating variations in requirements and thus facilitates more accurate determination

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[1]Wolfe and Young, Pt. 1, p. 237.

[2]Ibid.

[3]Ibid.

of the staff required for a single unit or the whole hospital.[1] "Census as it varies over its ususal range does not give a good indication of the variation of a unit's workload."[2] "Patients needs" should be the determinants of the workload.

Price, from her data, concluded that "day hours [hours available] of care were not consistently related to either census or patient classification," and further she indicates that hospitals using a subjective assignment of hours required per category or group of patients, showed a higher correlation between "needs" and actual "hours provided"than hospitals which used an assignment of hours per category determined by work measurement techniques.[3]

Bed occupancy relates to census in that it is a function of the average daily census and the bed capacity. "The key to increased bed occupancy is reduction in daily variations in inpatient service,"[4] and this basic approach

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[1]Robert J. Connor, Charles D. Flagel, Richard K. Hsieh, Ruth A. Preston and Sidney Singer, "Effective Use of Nursing Resources: A Research Report," Hospitals J.A.H.A. 35 (May 1, 1961), p. 33. Hereinafter referred to as Connor et al, "Nursing Resources."

[2]Robert J. Connor, "A Work Sampling Study of Variations in Nursing Workload," Hospitals J.A.H.A. 35 (May 1, 1961), p. 41. Hereinafter referred to as Connor "Nursing Workload."

[3]Elmina M. Price, Staffing for Patient Care. A Guide for Nursing Service based on a Research Report (New York: Springer Publishing Co. Inc., 1970), p. 56.

[4]Ibid.

to higher occupancy is dependent upon "avoidance of rigid assignment of medical-surgical beds by pay-status, sex or clinical specialty; equitable waiting list managment, and coordination of admission among hospitals."[1]

STAFFING AND UTILIZATION OF HOSPITALS

Much of the research on staffing and utilization of hospitals has, directly or indirectly, contributed to what is now commonly known as the Levels of Care approach. A comprehensive review by the Canadian Nurses Association provides a resumé of the literature concerning hospital nursing service, and traces some major trends and developments in approaches to staffing, as reflected by the literature, prior to 1936 and from 1936 to 1964, which provides a perspective for this type of research.[2]

Street, in her article on nursing service staffing, provides a comprehensive review of U.S. literature on staffing from 1925 to 1964. As early as 1937 it was recognized that standards for nursing care and practice "should be based on assessments of patients' needs rather than the current practice.[3] It is significant to note that although

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[1]London and Sigmond, p. 100.

[2]Historical Overview of Approaches to Staffing the Nursing Service Department (Ottawa: The Canadian Nurses Association, n.d.) Hereinafter referred to as "C.N.A. Overview."

[3]Margaret M. Street, "Staffing Problems in Nursing Service," The Canadian Nurse 61:2 (February, 1965), p. 92.

the need for developing valid techniques for the assessment of the nursing care required by individual patients has long since been recognized, up to the 1960's very little progress in that direction has been made in so far as staffing is concerned.[1] More recently however, much of the literature in nursing education and nursing practice is concerned with the assessment of the nursing care needs of patients and the development of methods to provide "patient centered" or "individual patient care."[2]

Drosness and others, in the first part of a two part report on the findings of a six month study of daily census by specialized unit for 12 acute hospitals,[3] based their investigation on the assumption "that the daily census of specialized units follows a consistent pattern of occurrence - one that can be described in statistical terms and then related to an optimum capacity."[4] In considering methods for more efficient use of hospital beds the authors suggest that "stabilization of census permits lowering the ratio of employees per occupied bed."[5] "Rather than ponder

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[1]Street, p. 92.

[2]"C.N.A. Overview" pp. 22, 23, and see also the works of Esther L. Brown, listed in Bibliography.

[3]The 12 hospitals were in Santa Clara County, California and are referred to as the HURP (Hospital Utilization Research Project) study area.

[4]Drosness et al, Part 1, p. 45.

[5]Drosness et al, Part 2, p. 68.

on differences in bed needs and standardized occupancy rates perhaps efforts should be directed to exploring why some departments achieve high occupancy rates and others do not."[1] More pointedly, in order to assess the need for facilities and services concerned with the provision of care to "hospitalized patients," we must ponder on what are the factors to be considered in order to make such assessments?

There appears to be a general consensus of opinion amongst the above authors that variations within patient censuses, occupancy rates, and patient turnover rates will tend to increase the workload of hospitals and particularly that of nurses. An accurate overall determination of "nursing care needs" must take into consideration the numbers and types of cases usually cared for, the ancillary services provided, the numbers and varieties of tests, treatments and medications given, as well as consideration of emergency demands within the hospital and community.[2]

THE HOSPITAL AND THE COMMUNITY

There appears to be an increasing awareness that nursing care is an integral part of health care, and thus nursing does not function in isolation but as a part of the hospital and larger community. Esther L. Brown points out

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[1]Gordon Forsyth, and R.F.L. Logan, Studies in Medical Care: An Assessment of Some Methods, Chapter IV (London: Oxford University Press, 1960), p. 69.

[2]Margaret Giffin, "Your Staffing Situation is Different," A.J.N. 52 (November, 1952), p. 1349.

how "almost every innovation in nursing is the indirect result of broader changes."[1] Social factors which influence patient care include the growth of the population, urbanization, greater economic prosperity in some areas yet large geographic areas of poverty in others, the knowledge explosion, health research concerning existing health systems, development of new health-care models and standards for measuring health service needs and providing health services, and also, the trend towards professional preparation and continuing education for nurses, medical and paramedical personnel.[2]

Jelinek identifies as the major component of any patient care operation five factors: the resources used, or "Input Facots;" the form of organization that is used or "Organizational Factors;" the workload imposed by any group of patients, characterized by number and condition of patients or "Workload Factors;" the elements other than those of direct patient care, such as other hospital departments or activities and medical staff organization, or the Environmental Factors;" and the outcome of the patient care system, categorized in three main groups: Patient care, patient satisfaction and personnel satisfaction which he regards as the

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[1]Esther L. Brown, Nursing Reconsidered a Study of Change (Philadelphia: J.B. Lippincott Company, 1970), Part 1 "The Professional Call in Institutional Nursing," p. 3.

[2]Ibid., pp. 3-13.

"Output Factors."[1] Robinson points out that patients' backgrounds including ethnic and religious factors, besides patient characteristics such as age, medical condition and mental status, can also be useful in planning for the care of patients.[2] Uprichard maintains that there are three major factors to consider in effective nursing staff utilization: "The physical environment, administrative policies and practices, and the clarity with which each individual nurse perceives her role."[3] A reliable method of assessment must take into account the size and design of the hospital building, the use of the hospital for training and overall objevyibrd of the hospital which play an important part in nursing activities.[4] Bates points out that physician availability, communication, consistency, and ability to coordinate his activities effectively with his colleagues when needed are essential to smooth nursing care.[5] Giffin examines the "varying factors" to be considered which influence the nursing needs and are unique to each situation. She discusses

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[1]Richard C. Jelinek, "Structural Model," p. 227.

[2]Geraldine Robinson, "From the Hospital, Where?" Nursing Outlook 15 (July, 1967), p. 48.

[3]Muriel Uprichard, "Best Utilization of Staff in Hospitals," Address delivered to the Annual Meeting of A.R.N.A., May, 1964, p. 1.

[4]Margaret Auld, "A Method by which the Necessary Nursing Establishment of a Hospital may be Estimated," Int. J. Nurs. Stud. 7 (London: Pergamon Press, 1970), p. 119.

[5]Barbara Bates, "The Better the Doctor does his Job, the Better the Nurse can do hers," The Modern Hospital 108 (January, 1967), p. 75.

the need to consider: the purpose, philosophy and objectives of the hospital; types of care such as custodial, technical and rehabilitative care; the organization of nursing service; the estimate of demands for nursing service such as medical and scientific knowledge and resulting changes in medical care, duration of hospital stay, seasonal trends, acuity rates, medical staff responsibilities; e.g. presence or absence of internes and residents; and the budgetary allotments. Consideration must also be given to type of community which the hospital serves such as the age of the population, type of industrial plants, which influence the character of service offered and training facilities.[1] Assessment of nursing needs also involves examination of nursing activities, appraisal of physical facilities and resources, as well as human resources, evaluation of method of staff assignment and consideration of satisfaction on the job which are different in each situation.[2]

Greenough points out that factors which influence "what and how" the nurse provides care to clients [the patients] include the beliefs of society about health care in general, and of the doctors' and the nurses' own beliefs about the relationship of the patients beliefs' to their own.[3]

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[1]Giffin, pp. 1348, 1349.

[2]Ibid., pp. 1350, 1351.

[3]Katharine Greenough, "Determining Standards of Nursing Care," A.J.N. 68 (October, 1968), p. 2153.

Differences in comparisons of nursing activity on different units in the same hospital or among hospitals result from "varying conditions and characteristics of the days and units compared," such as the size of the nursing staff, number and type of patients, physical design, and supervision of the unit.[1]

The above literature suggests that the factors which appear to have some influence on the provision of care to patients are numerous and diverse and can be viewed as being a complex combination of psycho-sociological, and institutional dimensions which are integrally related to broader social forces and changes. In order to consider approaches which attempt in a more comprehensive way to study the nursing care requirements of various types of patients, we will now turn to the Levels of Care approach.

LEVELS OF CARE APPROACH

The Levels of Care approach considers variations in the nursing care requirements of patients as well as variations in the types of services needed to provide care to differing groups of patients. In this portion of the Chapter the investigator will first introduce consideration of the Levels of Care concpet. followed by a discussion of categorizations based on types of patients. In that various methods have been developed to classify patients into Levels of Care,

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[1]R. C. Jelinek, "A New Approach to Analysis of Nursing Activities," Hospital J.A.H.A. 40 (October 1, 1966), p. 89.

these are then reviewed; statistical considerations are then cited.

THE CONCEPT OF "LEVELS OF CARE"

The need to examine the "mix" of hospitalized patients is a primary issue in the efficient use of general hospital facilities. Patients classified into various levels according to their care needs recognizes the "variability of demands for direct patient care."[1] A patient-care classification process assists not only in the economic use of existing facilities, but in the placement of patients in facilities offering the Level of Care most appropriate to his needs.[2]

The concept of "Levels of Care" devolves upon the ability to measure the variability in the care required by hospitalized patients. It incorporates the belief that volume and complexity can be determined by quantitative measurement of direct care requirement and thereby the grouping of requirements (and patients) into levels. The concept of "progressive patient care" embodies "Levels of Care" in that this approach involves placement of patients within the hospital according to the Level of Care needed by the patient

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[1]Charles D. Flagel, "Operations Research in a Hospital" Chapter 25, from Charles D. Flagel, W. H. Huggins, and R. H. Roy, Operations Research and Systems Engineering (Baltimore: Johns Hopkins University Press, 1960), p. 775.

[2]P. C. Gordon, J. M. Wanklin, N. H. Harvey and G. H. Hatcher, "An Approach to Patient Care Classification," Canadian Medical Association Journal 9 (December 10, 1966), p. 1228.

rather than by diagnosis, or clinical specialty.[1] The emphasis is upon the recognition of common needs and the suitability for common treatment or care.[2] "When a measure of patients needs is available, than the appropriate adjustment ....should be made, so that general differences in the needs of patients are always reflected in differences in the general levels of nursing staff on the various nursing units."[3] "Focusing of nursing functions on the needs of the patients would also alleviate whatever reserve or hesitation the graduate nurse might have in performing certain functions," and it may shift the concept of these functions in direct patient care from a "task orientation" to a "patient orientation."[4]

CATEGORIZATION BASED ON TYPES OF PATIENTS

In 1949 a study of New York Hospitals,[5] reported by the N.L.N. Education Committee, stated as a purpose the

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[1]W. Lees, and Biddulph, "Progressive Patient Care," 2 Parts, Nursing Times, (Part 1, January 26, 1968, and Part 2, February 2, 1968); Part 1, p. 13.

[2]*Ibid.*, p. 13.

[3]Richard C. Jelinek, "A Structural Model for Patient Care Operation," *Health Services Research* (Fall-Winter, 1967), p. 241; Hereinafter referred to as "Structural Model."

[4]Peter Kong-ming New, "Too many Nurses may be Worse Than Too Few," *The Modern Hospital* 93 (October, 1959), p. 106.

[5]*A Study of Nursing Service in one Children's Hospital and Twenty-One General Hospitals* (New York: National League of Nursing Education, 1948), p. 2.

following:

> "To develop a list of those factors which affect the nursing needs of adult medical and adult surgical patients, and which might be used as a guide"...for staffing.

This study developed measures which represented nursing needs as "expressed by the directors of nursing or their deputies of the hospitals where the data were collected in 1947."[1] It also listed factors considered useful as a base, affecting the nursing needs of patients which included degree of illness, control of activity, behaviour reaction, application of therapy, teaching and rehabilitation, and noted that classifying patients according to needs of patients expressed by these five factors represents the needs "as of the day and hour that the classification is made."[2] Since 1951 the U.S. Army Medical Service has experimented with developing a system of categorization of patients and found the "optimum number" of categories for their use to be three, "reflecting nursing needs" of hospitalized patients on active wards.[3] Marion Wright reported on a project in 1952,

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[1] Ibid., p. 12. In this study the criteria for inclusion in nursing personnel constituting the general nursing staff were whether workers of a cetain type, as a group, routinely carried out specific functions, e.g. bed baths, and whether the major portion of their time was given to direct nursing care of the patients.

[2] National League of Nursing Education Committee, "Criteria for the Assignment of the Nursing Aide," A.J.N. 49. Hereinafter referred to as "N.L.N. Criteria." The direct quote is taken from p. 314.

[3] Major Esther Claussen, "Categorization of Patients According to Nursing Care Needs," Military Medicine 116 (March, 1955), p. 209.

organized at Harper Hospital regarding staffing, and states "this study was designed to find out about the actual needs of patients,"[1] and began by tabulations related to "acuteness on all services, activity analysis, and time and observation studies."[2] A research project, called The Johns Hopkins Study, is considered quite significant as a description of "a system of patient classification by severity of illness." Staffing was also investigated in relation to classified patients in order "to determine nursing requirements on a day to day basis."[3] Ruth Preston, a member of this research team reported on the use of a "daily patient condition checklist" to examine the components of the inpatient census in order to add "significance and meaning for nursing" to that number.[4] Hansen reports on a technique which can be applied to indicate the "type and amount of nursing care required in each area" which is used to categorize patients and evaluate staff required, and the form is completed by the team leader or ward clerk.[5]

One of the major factors affecting nursing care

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[1]Marion J. Wright, "Improvement in Hospital Patient Care," Harper Hospital Bulletin (July-August, 1952), p. 103.

[2]Ibid., p. 104.

[3]Connor et al, p. 30.

[4]Ruth A. Preston, "Add Meaning to your Hospital Census," Nursing Outlook 10 (July, 1962), p. 466.

[5]Karl E. Hansen, "How to Measure Nursing Care Time," The Modern Hospital 100 (April, 1963), p. 93.

requirements of patients is that of the degree or acuity of illness of the patient, as exhibited by the patient's symptoms, and commonly classified as acute, moderate or mild.[1] The Johns Hopkins Study describes a system of patient classification by "severity of illness."[2] In Patterns of Patient Care the authors established classifications of degrees of illness for a total of 848 patient days, and reported that the amount of care required per day varied widely with different degrees of illness and within the acuity categories.[3] The Harper Hospital study included "tabulations of the percent of patient days that were critical, acutely ill, subacute and convalescent."[4] Paetznick, in her manual, discusses nursing care requirements of patients in terms of 'acuity of illness' and assignment of nursing staff based on this information.[5] "Some of the most useful reports to date," states Giffin, "are those which indicate the acuity of illness of patients who may be expected on any service at one time."[6]

Gradually, the emphasis seems to be shifting towards

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[1]"N.L.N. Criteria," p. 312.

[2]Connor et al, p. 30.

[3]George and Kuehn, pp. 23, 24.

[4]Wright, p. 103.

[5]Marguerite Paetznick, A Guide for Staffing a Hospital Nursing Service (Geneva: World Health Organization, 1966), pp. 19, 22.

[6]Margaret Giffin, "Your Staffing Situation is Different," A.J.N. 52 (November, 1952), p. 1349.

recognition of the multiplicity of factors unique to each patient, and ways and means of investigating patient needs and then "matching" the use of personnel and other resources to the needs to provide for these patients are being geared towards "classifying patients into groups or categories."[1]

The research project most significant to our study is one involving patient categorization done by Dr. Asa MacDonell and G. B. Murray reported in their article "An Index of Care." Their study is crucial in two respects to the one reported here: it serves as the primary basis for our operational definitions; and we made use of an adaptation of their data collecting instrument.

Specific Sub-Types of Patients:

Some studies have investigated the nursing needs of specific categories of patients (e.g. burn patients, poliomelytis patients, pediatric, and post-operative cardiac), and the findings have been used to establish standards of

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[1]The research studies reported by the C.N.A. (Historical Overview), resumé and Review of Literature in the article by Margaret M. Street (C.N. February, 1965), p. 92-3, include this shift in emphasis from 1950-1964. Some studies not referred to in this chapter are listed in the bibliography at the end of this research report.

[2]MacDonell and Murray, "An Index of Care," Application of some of the findings from the later work of MacDonell et al, Timing Studies, was crucial to the development of the methodology and these aspects are brought out in the chapter on methodology.

nurse staffing for these patients.[1] In her study Chutz found that even within sub-types of patients, the data did show "a pattern of care largely related to the acuity of illness,"[2] which was also reported by the Harper Hospital study and the Johns Hopkins Study.[3]

METHODS OF PATIENT CLASSIFICATION

Patient classification is concerned with criteria whereby quantitative and/or qualitative measures of differing care requirements can be determined. The methods developed, as reported in the literature, appear to distinguish between "Levels of Care" by virtue of the patients' dependency on the nurse,[4] and/or the degree of mobility or activity of the

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[1] Studies done for investigation of specialized categories of patients which were reviewed and may be useful to the reader were: Chow, Rita, "Postoperative Cardiac Nursing Research: A Method for Identifying and Categorizing Nursing Action," Nursing Research 18 (January-February, 1969), pp. 4-13. Sister Adrian Chutz, The Development of a Nursing Categorization of Burn Patients and a Burn Patient Nursing Care Index (New York: National League for Nursing, 1969). Esther Paulson, Norah Millward, and Irene Harkness, "Nursing Care Requirements for a Polio Unit," The Canadian Nurse 59 (July, 1963), pp. 624-631. Marilyn Poland, Nellie English, Nancy Thornton, and Donna Owens, "PETO A System for Assessing and Meeting Patient Care Needs," A.J.N. 70 (July, 1970), pp. 1479-1482.

[2] Chutz, p. 83.

[3] Wright, p. 103, and Connor et al, p. 30.

[4] E.g. See Lees and Biddulph, Part 1, p. 14; Part 2, p. 20; B. Moores, "The Effect of Length of Stay on Workload," International Journal of Nursing Studies, 7 (London: Pergamon Press, 1970), pp. 85-89; Operational Research Unit, Measurement of Nursing Care (Headington, Oxford: Oxford Regional Board, 1967), pp. 9, 17, 19, 21; hereinafter referred to as "Oxford Study," and Preston, p. 486.

patient,[1] and/or the nursing procedural requirments of the patient.[2] The number of categories and thereby Levels of Care vary with each method, and very often the researchers' initial categorization methods are modified to fewer or more categories as their classification systems were field tested.[3] Some researchers have related Levels of Care to nursing time and workload distributions, by use of work-measurement and timing studies for each Level of Care.[4] Emphasis should be placed on the point that such indices pertain to particular institutions or situations, and although the methods are applicable elsewhere, it is tenuous to assume that the specific indices are generalizable. The usual categories developed in these various studies revolve around groups of patients who require: intensive, moderate, or minimal nursing care; or, put another way: total, partial, or self-care.

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[1]E.g. See Claussen, p. 209; Connor et al, p. 30; Flagel, p. 773; George and Kuehn, p. 25; and Jelinek, "Structural Model," pp. 230, 243.

[2]E.g. See Claussen, p. 209; Diane Charter, "How the Firesen Concept Affects Nurse Staffing," Canadian Hospital (September, 1970), p. 53; Rita Chow, p. 4. George and Kuehn, p. 25; Huguette LaBelle, "P.L.A.N. Patients; Let's Assess Needs," N.B.A.R.N. News (August, 1969), p. 8; Hansen, p. 95; MacDonell and Murray, "An Index of Care," p. 499; and Ruth Stryker, "The Changing Roles and Functions or Nursing Service Personnel," J.A.C.H.A. 17, (April, 1969),p. 311.

[3]E.g. See Claussen, p. 209; and The Oxford Study, p. 17.

[4]E.g. See Connor et al; The Oxford Study; MacDonell et al, "Timing Studies;" and David H. Harris, "Nursing Staffing Requirements," Hospital J.A.H.A. 44 (April 16, 1970).

The New Zealand Health Service Research Unit developed a system of patient classification of:

> "four categories depending on the amount of nursing time, direct and indirect, required in their care but without reference to the skills needed. The four categories give a general indication of an individual patient's dependency and a quantitative estimate of the dependency of the group ranging from Category 4 - "Completely Dependent," Category 3 - "Very Dependent," Category 2 - "Partly Dependent" to Category 1 - "Independent." An Index of work to be done is currently assessed by reference to the dependency categories of the patients using weighting factors of 1, 5 and 10 for categories 1, 2, and 3 respectively. The weighting factors have the dimension of time, but they are relative, not absolute, and depend on what is chosen as the basic unit to which all others relate. No definitive work has been done on the establishment of precise weighting factors for staff, and any weights used in discussion were speculative and intended to demonstrate an approach to the problem of securing a reasonable match between nurses and the work to be done."[1]

Having discussed the antecedents and the Levels of Care approach, we will now turn to a discussion of statistical considerations central to the analysis of Levels of Care data.

STATISTICAL ANALYTICAL CONSIDERATIONS

The use of statistical techniques on Levels of Care data has been reported on very little, and even when they are reported, the specifics regarding the statistical analytical techniques are not explicated in the research reports. Some of the literature indicates the use of statistical techniques to discerne the significance of factors considered

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[1]Letter to M. McLees, a nurse from New Zealand dated February 18, 1971, from Health Services Research Unit, P.O. Box 5013, Wellington, Department of Health, New Zealand.

as "items" of required care for each of the levels when developing a method of patient classification.[1] Comparative statistical analyses have been used primarily to determine numerical values for each factor, such as the dependency level of patients, and to test these numerical values against nursing care time, (the latter being developed on the basis of timing and work measurement studies).[2] The formulae developed through comparative statistical techniques are reported[3] to be useful in determining material and human resource requirements in order to meet in a more flexible manner "the shifting needs." The comparative analysis used by Claussen was based on the number of nursing personnel and the number of patients in each Level of Care category, and her findings indicated that dependents of military personnel required appreciably different amounts of nursing care than military personnel.[4] Drosness and others in Part 1 of their study, reported use of census analysis, which included visual comparisons and mathematical tests (chi square and Kolmogorov-

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[1]E.g. Each of the references noted under the heading of "Methods of Patient Classification," p. 34 , discuss relationships and/or distributions of the average hospital census by category and allude to the development of rational and quantitative systems consonant with the variability of demand or patient care workloads.

[2]E.g. See Claussen, p. 211; Connor et al, pp. 30, 36, 39; Wolfe and Young, Part 1, p. 238; and MacDonell et al, "Timing Studies," pp. 12-18, 83.

[3]Connor et al, p. 30.

[4]Claussen, pp. 112-113.

Smirnov) of daily census data by unit frequency distribution curves, with the Poisson and normal curves.[1] Flagels work is relative to this last point. He reports on the importance of the fact that the distribution of "total care" patients is close to a "Poissón distribution," which would be expected theoretically with "independent and random" admissions, and he refers to the "exponential distribution of length of stay" in instances in which total care patients preempt the beds on a ward. "The importance of [these] characterist[s] is that the variance of the population is equal to its average."[2] After developing a "Direct Care Index" through relating nursing time to patient categories, Connor demonstrated that "time spent in direct nursing care is not significantly related to nursing personnel hours available;" but although he states that this conclusion was based on expanded analytical techniques, he does not specify the particular techniques used.[3] Wolfe and Young, in their study at Johns

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[1]Drosness et al, Part 1, p. 47. The project staff collected data by specialized unit from each hospital in the HURP study area from November 1963 to April 1964, and considered seasonal fluctuations, by collection of data for combined HURP study area from May 1963 to April 1964 by average daily census, (ADC). The Poisson and normal distribution relationships are described in statistical texts, as in Elmer B. Mode, Elements of Statistics, 3rd Ed. (Englewood Cliffs, N.J.: Prentice-Hall Inc., 1965), pp. 181-184.

[2]Flagel, p. 777. The "Poisson Distribution" arises where events occur over an interval of time in a random way. Variance is a measure of dispersion.

[3]Connor, italics mine. The direct quote is taken from p. 41.

Hopkins, also developed statistical formulae, using an "Index" equation and a "Productive Activity" equation, in order to calculate total workload on a nursing unit on a quantitative basis.[1] Jelinek's approach went beyond the aforementioned techniques by analysing similar data through the use of multi-variate statistical techniques in order to investigate the simultaneous effects of several factors affecting nursing activities. Empirical data was used to obtain estimates for the regression coefficients, standard error of the regression coefficients, and standard error of the estimate for each equation in the system, when developing his model.[2]

In their analysis of Level of Care data, Gordon et al made comparisons between distributions of patients according to selected variables between and among their six Levels of Care.[3] The Oxford Study also employed the "regression method" in order to analyse nursing care time and "dependency data" (i.e., Levels of Care data). This approach provided an approximate measure,[4] of the extent to which "variation in

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[1]Wolfe and Young, Part 1, p. 242.

[2]Jelinek, "Approach to Analysis," p. 90.

[3]Gordon et al, p. 1230.

[4]R^2, the square of the multiple correlation coefficient adjusted for degrees of freedom. See <u>The Oxford Study</u>.

the amount of nursing time is related to the dependency state of the patient based on ambulation, feeding, mental state, etc."[1] The Timing Studies which relate to the instrument being used to collect Levels of Care data for this research used factor analysis and regression analysis to correlate the components of direct nursing care against nursing care times.[2] In her study, Price reports that the correlations between patient classification and day care hours (nursing staff hours of work) were erratic, in that the range in degree of correlation was from +.58 to -.28.[3]

No studies that the researcher is aware of report the application of both parametric and nonparametric techniques to Levels of Care data. Our next step, then, is to fulfill the second purpose of this chapter, that of explaining the rationale underlying the research hypotheses.

RATIONALE UNDERLYING THE RESEARCH HYPOTHESES

It was underlined in the foregoing discussion pertaining to the Levels of Care approach that the assessment of patient care requirments is a multivariable measurement problem. The question of which variables would be the most

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[1] The Oxford Study, p. 19.

[2] MacDonell et al, Timing Studies, pp. 12-18.

[3] Price, p. 123. Statistically this range in degree of correlation is considered very weak.

productive in relation to Levels of Care data both in terms of their practical relevance to patient care and in terms of data collection and analysis. For example, A.N.A. Committee on Nursing Services states fourteen policies, practices and factors to be determined before nurse staffing requirements can be established.[1] "The variables from hospital to hospital and from unit to unit within a hospital are manifold, and unless staffing patterns are made with these variables in mind, the fit will be much less than perfect."[2] Along these same lines, George and Kuehn maintain that in order to develop a pattern for the provision of nursing care factors that need to be considered are:

> (1) Physical arrangements of the ward unit,
> (2) Kind, amount and condition of equipment and supplies available,
> (3) Services performed by other departments,
> (4) Degree of simplicity or complexity of nursing procedures required.
> (5) Number and kinds of nursing activities performed.
> (6) Ages of patients,
> (7) Length of stay of patients,
> (8) Acuity of illness of patients for whom care is provided.

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[1] "Statement on Nursing Staff Requirements for In-Patient Health Care Services," A.J.N. 67 (May, 1967), p. 1029. The individual statements refer to broad areas related to the specific selected variables, e.g. age, type of accommodation.

[2] Mary E. Brackett, "Developing Staffing Patterns in a Hospital Nursing Service," Hospitals J.A.H.A. (September, 1962), p. 68.

(9) Size and composition of medical staff,

(10) Amount of medical and/or nursing research in progress,

(11) Presence or absence of nursing and/or medical students and nurses.

(12) The desired standards of nursing service established by the hospital for each of the major clinical services.[1]

An important step in assessing nursing care requirements is "identification of patients receiving nursing care according to age, sex, and type of service they require and the level of dependency."[2] Harris reports that his information substantiated this requirement and showed the degree to which nursing requirements tended to vary in relation to these variables.[3] Gordon and others report that their findings revealed that factors such as diagnosis, length of stay, bed status (type of accommodation), hospital service, and discharge status, had statistically significant relationship to the Levels of Care to which patients were assigned; and to the distribution of these assignments. In contrast, they report differences in distribution according to age and marital status were small and did not reach statistically significant levels.[4] These somewhat broad perspectives pro-

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[1]George and Kuehn, p. 14.

[2]Harris, p. 64.

[3]Ibid., p. 65.

[4]Gordon et al., pp. 1228-1236. The purpose of this study was to develop a method of patient classification in order to allow for screening of patients most suitable for alternate care facilities. It was carried out in Halifax, Nova Scotia.

vide a beginning rationale for the choice of selected variables in this study; a more specific explication of the rationale underlying the choice of the variables used in this study will now be made, under the hypotheses headings used in Chapter I.[1]

SEX OF PATIENTS

Raphael in her survey reports on comparative views of patients, doctors and nurses about conditions of patients calculated for groups of patients classified by sex. There was an absence of significant differences of opinion found between the sexes, although she states:

> "contrary to opinion sometimes expressed that men patients tend to be more contented than women patients, such a finding was not supported in this study. Indeed this difference might be expected if contentment is related to amount of nursing care given. Male and female wards with comparable numbers of beds were generally allocated the same number of nurses, yet investigations have shown that female patients require more nursing care per patient especially because of the toilet facilities required."[2]

Paulson, in her study of a "polio unit" by comparison of staffing in male and female areas, reported that:

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[1]Namely, sex of the patients, type of nursing unit, nursing units with or without nursing students, type of accommodation occupied, age of patients, marital status of patients, and marital status, sex and age of the patients.

[2]Raphael, p. 214. The age distribution of the two sexes which showed that similar proportions of the two sexes were young, half of the men were middle-aged, and a large portion of women were elderly.

> "female patients required longer time for most routine care than male patients. Personal grooming, so important in maintaining morale, is time-consuming."[1]

There are

> "great variations in the physiological, biological and social functioning of persons who vary in their age, sex, and way of life,"[2]

and thus uncertainty and lack of knowledge in medicine in order to develop and apply "medical norms" to individual patients also exists in relation to "nursing norms." Women, on the average, live longer than men due to occupational and selective factors and appear to use medical facilities more than men.[3] Given these variations in nursing care needs on the basis of sex, it would seem logical to analyse Levels of Care data on the basis of the sex of patients.

TYPES OF NURSING UNIT

There are numerous references cited in the literature related to cultural responses and behavioural differences when seeking medical help, and in recovery from illness.[4] Biological changes and symptomatalogy differ in relation to medical diagnosis, and individuals differ in their responses

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[1]Paulson, pp. 625, 627.

[2]David Mechanic, Medical Sociology (New York: The Free Press, 1963), p. 24.

[3]Ibid., pp. 244, 253.

[4]E.g. See Mechanic, pp. 116-155; and E. Gartly Jaco, Ed., Patients, Physicians and Illness (New York: The Free Press, 1958), Chapter IV, pp. 246-283. Both of these works cite several references.

and behaviour; therefore one would expect differences between medical and surgical patients. From their study, George and Kuehn report that:

> "The amount of nursing care required per day by medical patients and surgical patients with different degrees of illness varied widely and the same was true of patients within each of the acuity categories."[1]

Care requirement fluctuations according to type of nursing unit are also reported by London and Sigmond: "Variation in medical-surgical demand at each hospital studied was much less than pediatrics or obstetrics because of the larger size of the medical-surgical services and the substantial proportion of "elective" admissions which can be scheduled."[2]

Further, Lees and Biddulph concluded: "An analysis of the hospital dependency categories has elicited the pattern specialty by specialty which indicates marked and important differences exist that militate against the theory of progressive patient care wherein classification relies solely on dependency and ignores disease and sex."[3]

In his development of a structural model, Jelinek found that "results based on the experimental units for the

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[1]George and Kuehn, p. 24.

[2]London and Sigmond, Part 2, p. 99.

[3]Lees and Biddulph, Pt. 2, p. 20. This statement relates to Levels of Care as this concept is embodied in that of "Progressive Patient Care."

single hospital - indicate that patients' nursing needs for nursing care, within a given nursing unit, have a tendency to average out, and thus do not vary a great deal."[1] Pardee reported specific patterns for each nursing unit which differed from unit to unit, since many procedures and treatments are not comparable as for example "few surgical patients would require the continuous cardiac monitoring which would be a major factor on a medical unit."[2]

The severity of illness does not necessarily equate with the amount of nursing care required: "For example a patient with a myocardial infarction could require less time from the nursing staff than a patient in isolation with staphylococcal infection," not in direct care necessarily, but because of the mechanics of isolation technique.[3] Gordon and others found, though type of hospital service, e.g. medicine and surgery, was not one of the criteria for patient classification, that there were highly significant (P = .001 level) differences on these services in the distribution of patients by levels.[4] The kinds of care needed for patients differs within Levels of Care, and patients whose emotional reactions and need for health teaching are

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[1]Jelinek, "Structural Model," p. 241.

[2]Geraldine Pardee, "Classifying Patients to Predict Staff Requirements," A.J.N. 68 (March, 1968), p. 519.

[3]Pardee, p. 517.

[4]Gordon et al, p. 1230.

not in keeping with their physical condition may require more care than those whose condition is considered to be more serious. The degree of physical dependency or level of activity is only one of the factors to be considered, and in order to direct provision of care towards meeting the psycho-social needs of the patients as well, other factors must also be considered in developing plans for patient care.[1] In terms of Levels of Care data, then, it seems a worthwhile endeavor to examine the differences in Levels of Care between medical and surgical patients and among medical or surgical patients.

NURSING UNITS: WITH AND WITHOUT NURSING STUDENTS

Nursing students are consciously assigned to patient areas in order to meet "educationalobjectives," even though students may in the process be making contributions to direct nursing care. It could be expected that students will more likely be assigned to nursing units where more patients exist to fulfill these criteria. Hatt reported that where teaching was required for medical students [nursing students could be analogous in this], observations revealed "that time in attendance on these rounds" was required by the ward sister.[2] Jelinek reports that the relationship between available staff and time devoted to direct patient care (DPC) presents an

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[1] George and Kuehn, pp. 24, 25.

[2] Hatt, p. 202.

inverse relationship where as staff increases, DPC decreases.[1] "Students need substantial instructional guidance to derive benefits . . . and to allow students to use knowledge and skills in an integrated fashion.[2]

> "Needed hours are also affected by such factors as change in resident physicians, the launching of a research project on the patient unit and the arrival of new internes."[3]

Patients react to who is caring for them in a hospital, and they want to be "assured that anyone other than a graduate nurse taking care of them knows them by name, is aware of their diagnosis and knows what should be done and how to do it."[4] The presence or absence of nursing students or, put another way, the use of nursing units for clinical laboratories for students in the patient care areas, would appear to be at least indirectly related to nursing care requirements of the patients on these units, and thus should be a factor studied in relation to Levels of Care data.

ACCOMMODATION OCCUPIED

Gordon and others found "bed status did not weigh heavily in the assignment of patients to either hospital or alternate care."[5] Theoretically a patient should have the

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[1]Jelinek, "Structural Model," p. 237.

[2]Hatrock, p. 42.

[3]Pardee, p. 520.

[4]Wright, p. 103.

[5]Gordon et al, p. 1232.

type of accommodation which best suits his care needs. One must be careful not to make the automatic assumption that the "sickest" patients should be in private rooms for it may be for instance, that an acutely ill paraplegic patient will progress much more quickly if he is in the company of similar types of patients. Conversely, a very "mildly" ill infectious patient may be confined to a single room. All other factors being equal, then, one would assume that accommodation is a function of patient care requirements. As with the other variables in this study, there are no criteria existing as to what the "ideal" accommodation mix is for a given Levels of Care patient mix, so that again the purpose of including this variable is purely that of description.

AGE OF PATIENTS

Biological and physiological changes are known to occur with age, a factor which would thus help to explain variations in symptomology and response to illness and medical care. As well, social values differ, and problems of "social development" are more predominant among the young whereas problems of "social integration" predominate in the community of the aged.[1] Age distribution of patients on a nursing unit is one "fundamental factor" to be considered in relation to Levels of Care data. For example, "an older patient may present problems which must be considered in

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[1]Mechanic, pp. 20, 21.

relation to the four categories of basic human and nursing needs, which are quite different from the problems which must be considered in meeting the needs of the post-adolescent."[1] In comparing age distribution of medical and surgical patients by age categories, a wide range was found, with the greatest number of both being between forty and fifty years of age.[2] In considering mental orientation of patients suffering traumatic injuries, variations in recovery from shock and confusion are reported to clear up more rapidly in the young patient than the elderly.[3] Raphael found age of patients related highly with satisfaction ratios of patients, and the "older patients were the most contented ones."[4] Thompson and others devoted a study to determine the amount of nursing care received for patients over and under 65 years of age, and reported that for each shift the hours for 65 and over group exceeded those for the younger group by a "daily difference of 0.91 hours or about 55 minutes."[5] Within the patient mix studied it was found that the 65 years and over group received 42 percent of the assignable observations while they comprised only 37 percent of the hospital population.[6] Georgette states that when devising a method of

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[1]George and Kuehn, p. 22.

[2]*Ibid.*, p. 21.

[3]Robinson, p. 48.

[4]Raphael, p. 214.

[5]Thompson, p. 36.

[6]*Ibid.*, p. 37.

classification, "that age should be considered and patients divided into over and under 65 years age groups."[1] It can be expected, then, that the distribution in Levels of Care will be different among age categories.

MARITAL STATUS OF PATIENTS: MARITAL STATUS, SEX AND AGE

In that life styles, which characterize differing socio-economic groups, expose them to different environmental risks, which in turn could be viewed as predisposing factors to varying medical conditions and coping responses, the marital status of a patient may be important in the nursing care requirements of patients. In a study done in England it was found that:

> "married people had lower mortality rates than single people and that with the exception of particular age-groups the widowed and divorced had higher mortality rates than either the married or single."[2]

It will be recalled that Gordon and others found that differences in the distribution of patients according to age and marital status by Levels of Care did not reach statistical significance.[3] There seems to be some evidence in the literature that sex and age of the patients, when considered, were significant variables as related to Levels of Care. In

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[1]Janet Kinney Georgette, "Staffing by Patient Classification," Nursing Clinics of North America 5, (June, 1970), p. 330.

[2]Mechanic, pp. 241-243.

[3]Gordon et al, p. 1233.

that marital status can be related to sex and age and life style (important in coping with illness), it seems logical to determine both the significance of marital status and the interaction between marital status, age and sex.

Having explicated the central concepts, the evolvement of the research methodology, we shall now turn to the specifics of the investigators methods.

CHAPTER III

METHODOLOGY

RESEARCH APPROACH

This is a descriptive, comparative survey. It is designed to compare the application of parametric and non-parametric statistical analytical techniques to Levels of Care Data, on the basis of selected variables. It will be noted that the variables of sex, ward type, nursing students, marital status, age, and specific ward type (medical or surgical), are those around which the research hypotheses are centered.[1]

The nature of this chapter is to provide information relevant to the "how" of the study, as well as to furnish details germane to understanding the application of the statistical techniques utilized in the analysis of the data. The sequence of this chapter is as follows: the variables are first discussed, then the research method is explicated; the study population, data-gathering samples, data collection instrument, and procedures for data collection and analysis are then presented. The investigator then delineates the properties of the statistical tests employed, cites the

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[1]The rationale explaining the choice of these variables is explicated in Chapter II, pp. 40-52.

research hypothesis, and presents a guide for the use of the tables included in the Appendices.

Variables

"A variable is a symbol to which numerals or values are assigned."[1] It is important to understand here that a symbol such as X or Y can take on any justifiable set of values, dependent upon the property or construct under study.[2] The variable X may symbolize, e.g., sex, or age, and the set of values will differ according to the one which it symbolizes. In this study, sex is assigned only two numerically coded "values," 1 for male, and 2 for female. However, in that age may have numerous values ranging from hours, to days, weeks, months, and years, it justifies being coded in terms of several sets of "value labels."

DEPENDENT VARIABLE

A "dependent variable" is defined as "the one predicted to, or the consequent."[3] The dependent variable, which can be thought of primarily as "Y"[4] in this study, is the

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[1]Fred N. Kerlinger, Foundations of Behavioral Research (New York: Holt, Rinehart & Winston, Inc., 1966) p. 32.

[2]Kerlinger, p. 32. defines a "construct as a concept deliberately adopted for special scientific purposes." Achievement is a concept, scores on achievement tests tell relative degrees of achievement which is a construct.

[3]Kerlinger, p. 39.

[4]"Y" will be used throughout this report primarily to represent the dependent variable, and "X" the independent variable.

Level of Care; and although one doesn't assume simple "cause and effect," one does assume that observed variation in Y implies a relationship with variations in X. The Chi square test was the initial statistical technique used to discern relationships between X and Y. The three divisions of the data producing sample[1] were used as Y when testing for relationship and for the homogeneity of samples.

INDEPENDENT VARIABLE

An "independent variable" is defined as "the one predicted from, or the antecedent."[2] There are seven independent variables included in this study.[3] However, when the specific categories (value labels) of the independent variables are tested, these are then specified, e.g., married males, 21-35 years, and treated as X. When testing for homogeneity of samples the Y variable, Level of Care, although not seen to "cause" a change was used somewhat artificially as X, which is seen to be analytically productive.

RESEARCH METHOD

The method is essentially that of "measuring." The nursing activities required by the patient, i.e., the criterion measures, are used in order to objectively measure

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[1]Hereinafter referred to as Samples 1, 2, or 3, in the Tables.

[2]Kerlinger, p. 39.

[3]Independent variables are listed on page 77, by "variable labels" and "value labels" for each variable.

Levels of Care. The nursing activities are those performed in "Direct Nursing Care" of the patients, and they are separated into three "Elements of Direct Nursing Care."[1] The Levels of Care data provide a measure of comparison, employing statistical techniques, on the basis of the selected variables.

LEVELS OF MEASUREMENT[2]

Measurement is defined as the process of assigning numbers to objects or observations, and the kind achieved is a function of the rules of assignment.[3] There are four levels of measurement, and each consists of a set of distinct theories, and "permissible" statistical tests. We will now discuss the three[4] measurement levels which pertain to the statistical analytical techniques employed and the assumptions and techniques applicable to each level.

NOMINAL

The nominal level is the weakest level of measurement, and thus level of data analysis, which should be employed when groups are identified categorically and numbers

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[1]"Direct Nursing Care," and "Elements of Direct Nursing Care" are defined in Chapter I, p. 7 and p. 8.

[2]Sidney Siegel, Nonparametric Statistics For The Behavioral Sciences (New York: McGraw-Hill Book Company, 1956), p. 22. (Information regarding levels of measurement, assumptions, and statistical tests primarily from this text although all statistical references provide similar information).

[3]Siegel, p. 22.

[4]Ratio scale was not used.

symbols are used to classify them. Diagnostic symbols, e.g. diabetic or cardiac nursing units, are used to identify a person or group of persons and constitute a nominal "scale." The formal properties of such a scale are those characteristics which, defined in verbal terms, involve a relation of "equivalence" between the member of each class in the "property being scaled,"[1] e.g. patients on diabetic nursing units. Symbols used to designate the groups may be interchanged without altering the essential information, and therefore the only kind of statistics to be used are those in which the nature of the data would be unchanged by such a transformation, e.g. employing the mode as an index of central tendency. Hypotheses can be tested using the Chi square test.[2]

ORDINAL

The ordinal level of measurement and level of data exist when groups can be identified in some type of "relation" to each other, and can be designated in reference to this relationship. Some relations among classes are: "higher than," "more than," or "greater than." When this relation holds for all pairs of classes so that a rank ordering can be completed, we have an ordinal scale. A system of grades where ranks are assigned to groups of scores is one such

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[1]Siegel, p. 23.

[2]Siegel, pp. 22-23.

example, e.g., a rank order of $9 > 8 > 7$.[1] The formal properties not only include the "equivalence" relation, but also the ($>$) "greater than" relation. Symbols are interchangeable providing there are consistent ways to designate the higher class vis-à-vis the lower class. The statistic most appropriate for establishing central tendency is the median, and hypotheses can be tested using a large group of non-parametric statistical tests, sometimes referred to as "ranking statistics."[2]

INTERVAL

The interval level of measurement exists when in addition to the relations of "equivalence and greater than," the "distances" between any two numbers [or classes] on the scale are of known size, and a constant unit can be assigned "to all pairs of objects in the ordered set."[3] The ratio of any two intervals is independent of the unit of measurement and of the zero point.[4] Temperature can be measured on interval scales (Centigrade and Fahrenheit) when the zero point

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[1]The carat ($>$) used to designate "greater than," but can be used for "higher," "more," "preferred to," as discussed in Siegel, p. 24. The opposite for "less than," or "lower" may be designated by ($<$).

[2]Siegel discusses ranking statistics on p. 25. This discussion on the ordinal level of measurement was developed on the basis of Siegel's writings, pp. 23-26.

[3]Siegel, p. 26.

[4]Ibid., pp. 26-27.

differs for the two scales but they both supply the same kind of information.[1] The formal properties of this measurement scale are such that numbers may be associated with positions, and "arithmetic operations may therefore be meaningfully performed." The arithmetic mean is the statistic appropriate for determining central tendency. Hypotheses may be tested by parametric statistical[2] tests, such as the t-test and F-test.

STUDY POPULATION AND SAMPLE

The parent group, or "universe," as defined by Fox, is "all possible people or measures relevant for the research"; and the "population" is defined as the "group to whom we wish our generalizations to apply."[3] While theoretically the "universe" underlying this study is all Canadian hospitalized patients, practically, in terms of developing a specific method for handling Levels of Care data, the more "immediate universe" is that of medical and surgical patients in Canadian general acute hospitals.

The population in this study consisted of patients on the medical and surgical nursing units in one general

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[1]Siegel, p. 27. Freezing occurs at 0 on the centigrade (C) scale and 32 on the Fahrenheit (F) scale. The ratio between temperature readings on one scale is equal to that on the other, $\frac{30-10}{10-0} = 2C$, $\frac{86-50}{50-32} = 2F$. Therefore the "ratio of any two intervals is independent of the unit of measurement and the zero point."

[2]Siegel, p. 28.

[3]David J. Fox, Fundamentals of Research in Nursing (New York: Appleton-Century-Crofts, 1966), p. 152.

acute hospital, during the period November 1970 to January 1971. The Canadian hospital used as the study site was a 515 bed general acute hospital, consisting of: five medical and six surgical nursing units; a maternity, a pediatric, and a psychiatric unit; a 10 bed intensive care unit; operating and post-anaesthetic rooms; and an emergency department. Other service areas included dietary, housekeeping, pharmacy, maintenance, and x-ray and laboratory services.

The nursing units were staffed by several categories of professional and non-professional nursing personnel and had a consistent staffing pattern for all three shifts, i.e., substantially the same proportions and types of staff on duty each twenty-four hour period.

The selected nursing units of the "sample," defined as "that portion of the population selected to participate in the study,"[1] consisted of patients on four medical and four surgical nursing units. These specific units were selected since they all had similar patient areas, i.e., private, semi-private, wards, and facilities for provision of services, e.g., utility area, supply area, etc., and were not set up for special groups of patients, e.g., urological, orthopedic, etc. Admissions to these nursing units were "random" insofar as patients were assigned to a unit according to type of clinical service (medical diagnosis) and type

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[1]Fox, p. 152.

of accommodation desired (ability to finance) and/or availability of the required type of accommodation. Doctors' preferences were not stipulated in relation to any specific nursing unit, and no one doctor had all of his patients on any one unit, excepting that one surgical ward was reserved for gynaecological patients whenever possible. The nursing units were segregated in terms of the sex of patients, but there were occasions when sexes were mingled on one unit. This presented little problem as the largest "ward" was a four bed patient area and transfers of this nature could be made easily as the specific needs arose to do so. The patient units chosen for study are listed below:

Four Medical Units

5 E	30 Bed	Female
5 W	30 Bed	Female
6 E	35 Bed	Male
6 W	35 Bed	Male

Four Surgical Units

3 E	35 Bed	Female[1]
3 W	35 Bed	Female
4 E	35 Bed	Male
4 W	35 Bed	Male

DATA-PRODUCING SAMPLE[2]

The "data-producing sample," is defined as "that portion of the selected sample which actually does participate

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[1]This was the unit used primarily for gynaecological patients.

[2]Hereinafter referred to interchangeably with "Total Sample."

in the study and produce data for the researcher."[1] The data-producing sample in this study was comprised of a total 791 medical and surgical patients. The data was collected on the basis of three data collection periods, thus the total sample data is a composite of the three sub-samples.[2]

The three data collection periods were twenty-four hours each in length (12 Midnight to 12 Midnight), and included all the patients on the eight selected units, on the following dates:

November 24, 1970	Tuesday [3]
January 26, 1971	Tuesday
February 16, 1971	Tuesday

In the first period there were 267 patients, 131 medical and 136 surgical patients. The second period consisted of 260 patients, with a division of 127 and 133 medical and surgical patients respectively. There were 131 medical patients and 133 surgical patients in the third period, providing a total of 264 patients in that subsample.

RELIABILITY AND VALIDITY OF SAMPLE

As mentioned above, all medical and surgical patients

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[1]Fox, p. 152.

[2]In Chapter IV and in the computer printouts included in the Appendices, the sub-samples are referred to as "Periods" 1, 2, or 3 or "Samples" 1, 2, or 3.

[3]Tuesday was selected in order to allow for the availability of the same head nurses to participate in the data collection, and to minimize outside influences on the data-producing sample.

on the selected nursing units on the data collection days were included in the sample. Data collection was planned for times when it was assumed that outside factors, e.g., surgical schedules, disaster, low occupancy, would not be atypical and would allow for conditions on the units that were consistent with daily fluctuations in patterns of variability.

Three study days were chosen in advance, and specific dates predetermined, in order to provide as representative a sample as possible for each ward and minimize the influence of "known" outside factors, (e.g. the O.R. schedule was heavier on Monday and the number of pre-operative patients was known to differ, as were immediate post-operative numbers, both factors which would affect the numbers of patients assigned to the various Levels).

Whereas originally the investigator had considered using two data-producing sub-samples, an expert suggested that three periods would be preferable for collecting Levels of Care data as it would provide adequate numbers for statistical testing in each of the categories for the selected variables and help to ensure representativeness of data.[1]

DATA COLLECTION INSTRUMENT

The instrument used was the Level of Care Assessment Return adapted by Department of National Health and Welfare

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[1]This suggestion was made by Irene Buchan, Federal Nursing Consultant, during a meeting, October 30, 1970.

Nursing Consultants from the form devised by Dr. Asa MacDonell, "to facilitate the classification of patients into Levels of Care by use of the MacDonell scale."[1] The form is divided into "Part 1: Identification." The information gathered for Part I was provided by an addressograph[2] system and additional information required and not included on addressograph plate was added. "Part 2: Patient Care" is divided into the three sections or "elements" of direct nursing care: Clinical Monitoring (A), Technical Nursing (B), and Non-Technical (Basic) Nursing (C), and each of these elements is further subdivided. Each subdivision was completed by the use of a check mark (✓) in the column opposite the item of care which the patient required. The column was left blank if the patient did not require that item of care.

The figures opposite each item in Part 2 are the numerical scores assigned to each item on the form. These scores were arrived at by "timing studies" which are reported on in detail by Dr. Asa MacDonell and others,[3] and are numerical values developed by the use of factor and regression analysis, tested against nursing care time. The MacDonell scale was used to determine the Levels of Care category for

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[1]MacDonell and Murray, <u>An Index of Care</u>, p.511.

[2]Addressograph information consisted of date, Nursing Unit, Room and Bed Number, Name, Hospital Number, Doctor or Doctors, if more than one, Year of Birth, Admitting Status, e.g., Elective.

[3]MacDonell et al, <u>Timing Studies</u>, p. 83.

DEPARTMENT OF NATIONAL HEALTH AND WELFARE
HOSPITAL INSURANCE AND DIAGNOSTIC SERVICES

LEVEL OF CARE ASSESSMENT RETURN

(Addressograph)

MONTH DAY YEAR

Nursing Unit Room-Bed (P) (Type of Accommodation)

Marital Status (M) NAME

70 - Hospital Number, Doctor or Doctors

Year of Birth Admitting Status

DATE	*STUDY DATE (24 Hour Period)*
PART 1 – IDENTIFICATION	
SERVICE	*MEDICINE*
NURSING UNIT	*5 - E*
NAME	--
AGE	*50 Years*
SEX	*F*
DATE OF ADMISSION	*December 25, 1970 / / Discharged: Jan. 26 03:00 p.m.*
DIAGNOSIS	*Coronary Insufficiency*
DATE OF OPERATION OR DELIVERY AND SURGICAL PROCEDURE	--

PART 2 – PATIENT CARE

A – CLINICAL MONITORING

		Check (√)	
1 – Vital Signs B.P.	More frequently than q2h		30
	Less frequently than q2h to B.I.D.		15
	Daily		5
	Less than daily		0
T.P.R./Weight	More frequently than q2h		20
	Less frequently than q2h to B.I.D.		10
	Daily		2
	Less than daily		0
2 – Consciousness	Comatose		50
	Semi-Comatose		25
	Conscious		0
3 – Electronic Cardiac Monitoring and/or Rhythm Regulation			50
TOTAL ▷			

PART 2 – PATIENT CARE (continued)

B – ASSESSMENT OF TECHNICAL NURSING

			Check (√)	
1 – Medication	a – Oral (application of ointments)	More frequently than once a day		3
		Once daily		1
	b – Injection (I.M., S.C., I.V. drugs, intradermal)	More frequently than once a day		3
		Once daily		1
	c – Intensive eye care (eye drops, ungs, irrigations			7
2 – Respiration therapy and maintenance	a – Art. Resp. (Tank or chest respirator rocking bed)	For 4 hrs. or more during the day		20
		Once daily		5
	b – I.P.P.B. (Bird, Bennett, deep breathing and coughing)	More frequently than once a day		10
		Once daily		5
3 – Suction	a – Air Passages	More frequently than once a day		15
		Once daily		5
	b – GI Tract (Continuous or intermittent, includes obtaining specimen)	More frequently than once a day		5
		Once daily		5
4 – Infusion and/or transfusion (insulin shock, E.C.T.)				10
5 – Oxygen (catheter, mask, tent, croupette, steam)				1
6 – Tube feeding				4
7 – Drainage of Body, Wounds, Cavities or organs (except urinary bladder) (Post-operative drains, postural drainage)				10
8 – Surgical dressing (except to decubiti) foments, spoon bathing to eyes, (sutures, compresses, HWB., ice cap, sitz bath, mouth care, perineal care, soaks, slings, elastic bandage)				7
9 – Decubitus ulcers				5
10 – Catheters (suprapubic, urethal, or condom drain) – single catheterization, irrigations				7
11 – Artificial kidney, peritoneal, or other dialysis				20
TOTAL ▷				

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(Over)

PART 2 – PATIENT CARE *(continued)*

C – ASSESSMENT OF NON-TECHNICAL (BASIC) NURSING CARE		Check (√)	
1 – Dependent Nursing Care for	a – Positioning in bed *(turning, rubbing, traction, casts)*		7
	b – Feeding *(assistance with sippy or gastric regimes)*		13
	c – Washing hands and face *(basin, a.c. meals etc.)*		4
	d – Tub and Bed Bath *(sponge bath in bed including bed making, shower)*		3
2 – Continence	a – Urine Incontinent		26
	Controlled continence *(toilet routine, panning, specimens, taking to B.R., testing urine on unit, intake and output).*		13
	b – Feces Incontinence		26
	Controlled continence with regular enema or suppositories		13
3 – Ambulation *(Check only one if applicable)*	a – Walks independently		0
	b – Walks with human assistance		3
	c – Walks with cane, crutch, etc. without human assistance		0
	d – Walks with cane, crutch, etc. with human assistance		3
	e – Gets about independently in wheelchair		0
4 – In and out of bed *(Check only one)*	a – Gets in and out of bed independently		0
	b – Gets in and out of bed with assistance *(not lifting)*		3
	c – Gets in and out of bed only when lifted		3
	d. – In bed all the time		3
5 – Mental State	a – Confused or intermittently confused		5
	b – Lucid		0
	TOTAL ▸		

each patient.[1]

RELIABILITY AND VALIDITY OF INSTRUMENT

The data gathering instrument employed in this study has been used extensively in general acute hospitals in Canada for measuring "Levels of Care" and is considered a reliable tool for measuring Levels of Care. As is immediately obvious, subjectivity, is not a problem in checking off the items, e.g., a patient either requires medication once daily or he does not.

So far as validity is concerned, on the basis of the literature reviewed, it is the investigator's opinion that the "MacDonell scale" is the most valid one available. MacDonell and Murray state:

> "In our examination of the elements of classifying types of patients on the basis of care they receive in the hospital, several points became apparent. The type of care provided bore little relationship to clinical diagnosis. On the other hand, the activities of nurses relative to the individual patient appeared to have a direct relationship to the type of care provided."[2]

The above researchers' essential point, then, is that their instrument accurately reflects the type of care "provided." We say "provided" because the instrument records the type of care which the patient requires; it does not assure us that

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[1]MacDonell et al, Timing Studies, p. 151. This method was used by the Federal Nursing Consultants.

[2]MacDonell and Murray, An Index of Care, p. 499. The purpose of the study was to develop a method of patient classification on the basis of direct nursing care provided to patients.

the care was indeed given. While this latter point presents obvious limitations in relation to the actual Level of Care given, for the purposes of this study the instrument would appear at least to be a valid reflection of the care required.

The investigator would draw to the readers attention that the items listed in Part 2 of the form do not, in any way, get at qualitative considerations. A second fundamental point is that the items do not refer to psycho-social requirements as such. However, in this latter case, MacDonell and others consider that the weighting for the numerical values related to each item on the form included "the physical and emotional preparation of the patient, the supportive interrelationship between nurse and patient, and the performance of the procedure."[1] In that provision of the items of care listed on the form can not be assumed to have been given, clearly, the psycho-social requirements of care related to these items can only be regarded as a reflection of care required.

In terms of the focus of this study, i.e., statistical analysis of Levels of Care data, the need for reliable and valid measurement is, clearly a vital requirement, and

[1]MacDonell et al, Timing Studies, p. 7.

the instrument chosen would seem to meet these criteria.[1]

PROCEDURE FOR DATA COLLECTION

The Executive Director of the general acute hospital chosen[2] for study was approached during the summer of 1970. After discussions with him, as well as with the Director of Nursing Service and the nursing staff involved, it was considered agreeable to use the selected nursing units for data collection.

Prior to collection of the data, an orientation meeting was held with the head nurses on the nursing units selected and the method of completion of the form was provided.[3]

SEQUENCE OF DATA COLLECTION

On each of the dates chosen, the Levels of Care

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[1]K. Sjoberg, and P. Bicknell, Patient Classification Study (Saskatoon, Saskatchewan: University Hospital, 1968). In this study it was found, a patient classification tool devised for use here, MacDonell's proforma, and Head Nurse Categorization, were largely equivalent in their outcome. The chi squared test of "goodness of fit" was applied and in each case there was a high degree of association $p\chi^2 \ll$ .001 and associated probability. It seemed wise to use the more widely tested instrument.

[2]Any general acute hospital which had a sufficient number of medical and surgical patients could have been used for data collection. However, this particular hospital was chosen as it met the data requirements and, further, the investigator had previously done a "pilot study" there relating to patient categorization by "Levels of Care."

[3]MacDonell and others, Timing Studies, pp. 145-150. The Guide for use of the Instrument was used previously by Dr. A. MacDonell and also by the Federal Nursing Consultants.

assessment forms were addressographed, and patient identification completed for all the patients on the unit at midnight, and the form was then put on the patient's chart. For those admitted after midnight, a form was completed as above at the time of admission, and patients discharged after midnight on the study day had part two of the form completed. These forms were then kept on the nursing unit until they were submitted to the investigator. The "Part 1 - Identification" of the form was completed by a ward clerk and checked by the Head Nurse or the researcher. "Part 2 - Patient Care" of the form, was completed by a check mark (✓) in the column opposite the item of care required by the patient. This was done by the Head Nurse according to the guide provided.[1] The column was left blank if the patient did not require that item of care.

PROCEDURE FOR COMPILING DATA

The Levels of Care were calculated by the researcher for each of the data collection days. All omissions or questions related to contents were discussed with the Head Nurse and corrected at that time whenever necessary. Most corrections related to "Part 1 - Identification" of the form, since additions required and decided upon prior to collection were not printed on the form.[2]

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[1]MacDonell and others, Timing Studies, pp. 145-150. This guide was, also, used by Federal Nursing Consultants.

[2]These additions related to marital status, type of accommodation, and discharge time on the chosen study date.

The method used to calculate Levels was addition of the numerical weights assigned to the items checked in the various sections.[1]

STATISTICAL TESTING

All data were processed by automatic data-processing equipment.

Computer Coding

The data from the Level of Care Assessment Return was coded for computer processing into numerical form, for both categorical and quantitative elements, by the researcher. The patient's name was not used as they were identifiable by their hospital identification number. The data were coded to facilitate the use of punch cards and magnetic tape for computer analysis. The code key developed by the investigator is outlined in Table 1.

Card Punching

The card punching was carried out from the coded data forms by a professional card puncher.

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[1]MacDonell and others, Timing Studies, p. 151. This method has also been used by Federal Nursing Consultants. If the total score in Section A (Clinical Monitoring) was 45 or over and/or if the score in B (Technical Nursing) was 30 or over, the patient was categorized into Level III. If the total score in Section A, B, C, (Non-Technical (Basic) Nursing), was a combination of: A = 10 or less, and B = 5 or less, and C = 10 or less, then the patient was categorized into Level I. The remainder fell into Level II.

TABLE 1
PUNCH CARD CODE KEY
FOR DATA PROCESSING

Variable No.	Column	Variable
I	1	I.D. (70 or 71)
	2	(up to 5 digits)
	3	
	4	
	5	
	6	
	7	
II	8	Accommodation (3)
1		Private
2		Semi-Private
3		Ward
III	9	Sex (2)
1		Male
2		Female
IV	10	Age (6)
1		Under 20 years
2		21 - 35 years
3		36 - 50 years
4		51 - 65 years
5		66 - 80 years
6		Over 80 years
V	11	Marital Status (6)
1		Married
2		Single
3		Widowed
4		Divorced
5		Separated
6		Other
VI	12	Attendent Doctor (4)
1		General Practitioner
2		Surgical Specialist
3		Medical Specialist
4		Other
VII	13	Type of Ward (2)
1		Medical
2		Surgical

TABLE 1--Continued

Variable No.	Column	Variable
VIII	14	Specific Ward (8)
1		3E Surgical
2		3W Surgical
3		4E Surgical
4		4W Surgical
5		5E Medical
6		5W Medical
7		6E Medical
8		6W Medical
IX	15	Surgery Performed (2)
1		Yes
0		No
X	16	Level of Care (3)
1		I One
2		II Two
3		III Three
XI	17	Level II Extended (2) (over 30 days)
0		No
1		Yes
XII	18	Scores A (Clinical Monitoring)
	19	(up to 3 digits)
	20	[0-207]
XIII	21	Scores B (Technical Nursing)
	22	(up to 3 digits)
	23	[0-149]
XIV	24	Scores C (Non-Technical Nursing)
	25	(up to 3 digits)
	26	[0-125]

TABLE 1-Continued

Variable No.	Column	Variable
XV		Total Scores (9)
1	27	A - over 10
2		equals 10
3		under 10
1	28	B - over 5
2		equals 5
3		under 5
1	29	C - over 10
2		equals 10
3		under 10
XVI		Date of Admission
	30-31	Month 1 - 12
	32-33	Day 1 - 31
	34-35	Year 70 - 71
XVII	36	Discharged Study Day (2)
1		Yes
0		No
XVIII	37	Days in Hospital (7) (Admission - Study Date)
1		Under 24 hours
2		1 - 2 days
3		3 - 7 days
4		8 - 14 days (2 weeks)
5		15 - 21 days (3 weeks)
6		22 - 29 days (4 weeks)
7		30 and over
XIX	38	Nursing Students
1		Yes
0		No
XX		Number Students
01-10	39	(up to 2 digits)
11-15	40	[0-15]

TABLE 1-Continued

Variable No.	Column	Variable
XXI		Year Level of Student (3)
	41	1st Year
	42	2nd Year
	43	3rd Year
XXII	44	Samples
	1	
	2	
	3	

Magnetic Tape

The data from the cards were transferred to magnetic tape to facilitate repeated and convenient use. This step as well as the computer programming for statistical testing was carried out by a statistical consultant. The computer programs used were: (1) SPSS (Nic, Bent and Hull) Statistical Package for the Social Sciences; and (2) DERS, Division of Educational Research Services, Computer Program Library, NONP05, ANOV10, ANOV15. Following the transfer of the data to magnetic tape the data were processed, and the presentations of computer results were in the form of tables and included citations as to the statistical tests used.

PROCEDURE FOR ANALYSIS OF DATA

The data analysis includes both descriptive and inferential statistical tests. Prior to data collection, the investigator in consultation with experts in the field[1] chose the 5 percent (.05) level, of statistical significance. The analysis reports up to 10 percent (.10) level of significance, as it is felt that in some cases this level may be considered appropriate by some readers. The sequence of analysis follows a comparative analysis, by statistical test, on the basis of selected variables, for each sub-sample and the total data-producing sample. It will be recalled that the dependent variable, Levels of Care, and the seven inde-

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[1]The experts included nursing consultants and a consultant in statistical analytical technique.

pendent variables around which the hypotheses center are those of: sex, age, marital status, type of ward, specific ward, accommodation occupied and nursing students.[1] These variables were abbreviated and coded for computer use. The variable labels are shown below in both their abbreviated and proper forms. The "value labels" are the categorical breakdowns or the sets of values for each of the variables. E.g., these value labels were coded, (1) private, (3) widowed, for computer usage and the code numbers as well as code words (names) are shown in the tables and in the statistical analysis. The names and codes are as follows:

VARIABLE LABELS - ACCOM, ACCOMMODATION
SEX, SEX
AGE, AGE
MARITAL, MARITAL STATUS
WDTYPE, TYPE OF WARD
WARD, SPECIFIC WARD
NSTUDENT, NURSING STUDENTS
LEVEL, LEVEL OF CARE

VALUE LABELS - ACCOM
(1) PRIVATE
(2) SEMI-PRIVATE
(3) WARD

SEX
(1) MALE
(2) FEMALE

AGE
(1) UNDER 20 YEARS
(2) 21 - 35 YEARS
(3) 36 - 50 YEARS
(4) 51 - 65 YEARS
(5) 66 - 80 YEARS
(6) OVER 80 YEARS

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[1]The rationale underlying the choice of these independent variables is explicated in Chapter II, pp. 40-52.

VALUE LABELS - MARITAL
(1) MARRIED
(2) SINGLE
(3) WIDOWED
(4) DIVORCED
(5) SEPARATED
(6) OTHER

WDTYPE
(1) MEDICAL
(2) SURGICAL

WARD
(1) 3E SURGICAL
(2) 3W SURGICAL
(3) 4E SURGICAL
(4) 4W SURGICAL
(5) 5E MEDICAL
(6) 5W MEDICAL
(7) 6E MEDICAL
(8) 6W MEDICAL

NSTUDENT
(1) YES
(2) NO

LEVEL
(1) I ONE
(2) II TWO
(3) III THREE

As underlined earlier, the level of analysis is integrally associated with the type of statistical test used. The statistical model (i.e., nature of the study population and the manner of sampling) and the measurement required (level of analysis presumed to be attained) specify the conditions associated with every statistical test and its subsequent validity. The conditions of a statistical model are called the "assumptions" of the test.[1] The nature of parametric and non-parametric statistics lies in the assumptions made about the data. In that it is crucial to understand these different assumptions, examples and comparisons are explicated below.

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[1]Siegel, pp. 23-26.

STATISTICAL ASSUMPTIONS UNDERLYING THE DATA

The "assumptions"[1] underlying a statistical test, as was stated earlier, are the conditions of the "statistical model."[2] A statistical test is not "valid" unless its characteristics are consonant with those of the level of measurement. Thus the nature of a population, sampling methods, and measurement level reached, by data initiate the statistical techniques to be used and most often we are not able to test whether the conditions of the statistical model are met and must assume they are.[3] However, in regards to the measurement level of our data, there are specific relationships which we can consciously delineate. Nominal data have no "quantitative aspects" and should not be computationally processed, ordinal data can be placed in order and processed by the "percentile system" and interval data possess an "arithmetic relationship" and can be processed by the "moment system."[4] The nominal scale, which requires a categorical difference between two groups and equivalence relation within one group, is thus

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[1]An "assumption" is considered as preliminary to a "Presumption," where we "presume" the assumptions are met when we are unable to test.

[2]Siegel, p. 18.

[3]_Ibid._, p. 18.

[4]David Fox, _Fundamentals of Research in Nursing_ (New York: Appleton-Century-Crofts, 1966), p. 72. "Percentile System" conceptualizes only an ordered distribution whereas the "Moment System" relates to system of focus in physics with a specific distribution and "distance" from the physical center or arithmetic mean.

applicable to Levels of Care data. In that the three Levels of Care are considered to assume ($>$) relation to each other (i.e., the Level III patient is seen to require "more care than" a Level II patient, who in turn requires "more care than" a Level I patient). Levels of Care data would appear to permit the rank ordering of data on an ordinal scale.[1] The "more than" relation is "irreflexive, asymmetrical, and transitive."[2] It is considered doubtful by the investigator if an interval scale, which requires that distances between any two levels (measures) be of a known size and equidistant, is achieved by the Levels of Care data. In the latter case, it will be remembered that the question of the appropirateness of interval techniques is one of the basic elements central to the basic research question underlying this study.

The assumptions underlying the parametric statistical models presume independent observations, normally distributed populations, same or known ratios variances, measured in at least interval scale, and for the F-test the means of these normal homscedastic (equal variance) populations must be additive in effect. When these assumptions are valid, these tests (t-test, F-test) are most likely to reject the

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[1]The reader should treat this not as a specific research assumption but as a general statement. The applicability of ordinal techniques to the data in this study is delineated in Chapter IV.

[2]Siegel, p. 24. Definition of these terms is as follows: Irreflexive: not true for any x that $x>x$, Asymmetrical: if $x>y$ then $y<x$, Transitive: if $x>y$ and $y>z$ then $x>z$.

null hypotheses.[1]

Non-parametric statistical models are relevant to ordinal and nominal data; they do not have such extensive presumptions as those cited above. Some require a "continuum underlying observed scores" in which some scores in the discrete categories may be closer to one of the scores than to others in the same category[2] (e.g., actual scores may be stanines 8 and 9, where some individual scores of 8 are closer to 9 than others). Although these tests also presume independent samples and an underlying continuity of the variable under study, these assumptions are weaker and fewer than those required by parametric models. The power of a non-parametric test is increased by increasing the size of N (sample) and probability statements obtained are "exact" regardless of the shape of population from which sample is drawn.[3]

The assumptions required by parametric statistical models are not met by our data. It is considered more appropriate, then, to use non-parametric statistical techniques to treat the Levels of Care data. When parametric statistical techniques are used with data which meets only non-parametric assumptions, there is the danger of error in both probability statements and decisions about hypotheses.[4] Again, the inves-

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[1]Siegel, p. 19.

[2]Ibid., p. 19.

[3]Ibid., p. 32.

[4]Ibid., p. 24.

tigator would underline that she is employing interval techniques in order to compare those outcomes with techniques which "meet" the assumptions about the data and those which probably do not meet the assumptions.

TECHNIQUES APPLIED

The statistical techniques were chosen with the help of a consultant and were considered in relation to their appropriateness for testing the hypotheses, and facilitating the comparative statistical analysis which the researcher task required. The data on one dependent variable (Level of Care) which were measured were considered th reach an ordinal level, with an underlying continuum, which will be shown in Chapter IV.[1] The interval techniques were employed to allow for comparison of the findings and to answer the question: Are the conclusions reached different when using nominal, ordinal and interval techniques with Levels of Care data?

The Chi Square test, for two independent samples, and for k independent samples, as well as the Fihser's Exact Probability test, for 2 independent samples of small size, were the nominal statistical techniques employed.

The Kolmogorov-Smirnov and the Mann-Whitney U tests, for 2 independent samples, as well as the Kruskal-Wallis one

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[1]For example, a patient may be classified in Level II with socres in A, B, C, closer to or further away from those required to be in Level III. In other words, there is an underlying continuum in scores in A, B, and C for numerous patients in the same level.

way analysis of variance by ranks, for k independent samples, were the ordinal statistical techniques employed. Spearman's Rank Correlation Coefficient (R_s) was calculated to measure the association of the ordered series.

The interval statistical techniques utilized included the t-test, for two independent samples, and the F-test one way analysis of variance of means, for k independent samples. The Pearson Product Moment Correlation Coefficient (R) was calculated to measure the degree of association between two sets of interval scores.

A summary of the statistical techniques used in this study is listed below:[1]

NOMINAL LEVEL OF MEASUREMENT: TECHNIQUES APPLIED:

1. CHI-SQUARE TEST (χ^2): used to determine the significance of differences between two independent samples or K independent samples when discrete categories (nominal or ordinal) constitute the data. The hypothesis underlying the test is that the groups differ with respect to some characteristic and therefore with respect to the relative frequency with which group members fall into several categories. If the probability given for the observed value of χ^2 for the observed df (degrees of freedom) is equal to or smaller than the value at the chose level of significance (.05 level), then one would reject the hypothesis of difference and accept the null hypothesis (H_o).[2]

2. FISHER EXACT PROBABILITY TEST (FEP): a useful technique for analyzing discrete data for two small samples, and/

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[1]All of these tests are, to a greater or lesser extent, described in the "Statistical References" section of the Bibliography. All tests as described here have been evolved on the basis of Siegel.

[2]Siegel, pp. 104-111.

or when scores all fall into one mutually exclusive category. The "P" value is used to permit rejection of the H_o and is the exact probability of observed occurrence. The P value is doubled for two-tailed tests.[1]

ORDINAL LEVEL OF MEASUREMENT: TECHNIQUES APPLIED:

1. KOLMOGOROV-SMIRNOV (K-S): used to test whether or not two independent samples are drawn from the same population. "The two-tailed test is sensitive to any kind of difference in the distributions from which the two samples were drawn--differences in location, in dispersion, skewness, (central tendency), etc." The probability associated with the D value--maximum absolute value deviation--may be determined by computing χ^2 and using the χ^2 table for determining significance.[2]

2. MANN-WHITNEY U TEST (M-W): used to test whether or not two independent samples are drawn from the same population. It is a technique based on ranks, and assumes that scores represent a distribution with an underlying continuity. The U score is converted to a Z score, and the normal curve is used to assess the calculated Z (.05 level 1.96, .01 level 2.58). This is a powerful test and an excellent substitute for the t-test but it does not have the restrictive assumptions of the t-test.[3]

3. KRUSKAL-WALLIS ONE WAY ANALYSIS OF VARIANCE BY RANKS (K-W): is an extention of Mann-Whitney U Test which allows tesing of K independent samples. The statistic H computed takes the χ^2 distribution with df = K-1 (number of groups minus one). Probability is associated with the χ^2 value. The H statistic is comparable to the F-test statistic without the restrictive assumptions of the latter.[4]

4. SPEARMAN RANK CORRELATION COEFFICIENT (R_s): is a measure of association requiring both variables to be in at least an ordinal scale to allow individuals or objects to be ranked in ordered series. It is used to determine the relationship between X's and Y's; correlation would be perfect if $X_i = Y_i$ for all i's and, therefore, the use of various differences ($d_i = X_i - Y_i$) is an indication of disparity between two sets of rankings. $(d_i)^2$ is employed

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[1]Siegel, pp. 96-104.

[2]Siegel, pp. 127-136, quotation from p. 127.

[3]Siegel, pp. 116-127.

[4]Siegel, pp. 184-192.

to avoid positive and negative cancellation of the d_i's. Significance is determined by computing a t value and using t-value tables.[1]

INTERVAL LEVEL OF MEASUREMENT: TECHNIQUES APPLIED:

1. T-TEST (T): is the parametric technique usually employed for analyzing data from two independent samples, testing the mean of the sample against the mean of the population. It requires an interval scale and a normally distributed population with equal variance and "significant difference" between the means is determined on the basis of t-value tables.[2]

2. ANALYSIS OF VARIANCE (ANOV) F-test (F): is used for testing several independent samples, and requires an interval scale as well as parametric statistical model assumptions. The test compares variation in the sample to variation in the population. Relationship between the selected and data producing samples determines the "extent" of the representativeness of data-producing sample.[3]

3. PEARSON PRODUCT MOMENT CORRELATION COEFFICIENT (R): is used as a measure of the "degree" of relationship between two sets of scores, a sample score and the population score. It assumes that scores are from a "bivariate normal distribution," and represent at least an equal-interval scale. The coefficient is computed and tests of significance of R at the stated level of probability determine whether association exists in the population from which a sample was drawn.[4]

MATHEMATICAL PROPERTIES OF STATISTICAL TESTS

In that there are mathematical properties which are considered important in evaluating the usefulness of a statistical test, the investigator elected to provide a brief

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[1]Siegel, pp. 203-213.

[2]Ibid., pp. 19-20, 28, 62, 96.

[3]Ibid., pp. 19-20, 28, 160, 174.

[4]Ibid., pp. 195-196.

explanation of these properties.[1]

The level of significance of a statistical test (α) designates the level of probability (.05 level) that is considered appropriate to warrant support of the hypothesis being tested, and is the procedure on which decisions are based. We are testing the null hypotheses of "no difference" designated by symbols, (H_o:1 to H_o:10), and thus what we are interested in is the ability to reject these hypotheses in favor of the alternative hypotheses designated by symbols, ($H:_1$ to $H:_{10}$).[2]

TYPE I AND TYPE II ERROR

The "decision rules" established by the significance level (α) in statistical tests are "at most equal to the probability of making an error."[3] If H_o is rejected when in fact H_o is true (i.e., accepting an hypothesis of difference when in fact there is no difference), the case is known as a Type I error. Thus, the probability of making a Type I error is controlled by the significance level (α). This means our established level of significance (.05 level) indicates there

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[1]Further details are available in the texts listed under the heading "Statistical References," in the Bibliography.

[2]The hypotheses are stated in the positive or alternative form in Chapter I and the null form for testing in this chapter.

[3]B. J. Winer, Statistical Principles in Experimental Design (New York: McGraw-Hill Book Company, 1962), p. 10.

is a 5 percent chance of making a Type I error. The opposite kind of erroneous decision is accepting H_o when in fact H_o is false, (accepting an hypothesis of no difference when in fact there is a difference) and is known as a Type II error.[1] Again, the probability of making a type II error represented by β "is inversely related to α, where a decrease in α will increase β for any given N." In order to reduce the possibility of both types of errors, the N must be increased.[2] The two types of errors are not independent and Type II error is controlled indirectly by the research design, where the most costly error would be a Type I error.[3]

POWER EFFICIENCY OF STATISTICAL TESTS

The "power" of a test is the "probability of rejecting a false hypothesis and is equal to $1-\beta$."[4] Power is dependent upon the divergance between the hypothesized and true condition, the size of α, the establishment of the rejection region, and the sizes of the samples used in the test.[5] The power-efficiency is an abstraction pertaining to

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[1]David J. Fox, Fundamentals, of Research in Nursing (New York: Appleton Century Crofts, 1966), p. 135.

[2]Siegel, p. 9.

[3]Winer, p. 11.

[4]James V. Bradley, Distribution-Free Statistical Tests (Englewood Cliffs, New Jersey: Prentice-Hall Inc., 1968), p. 56. ("where β is the probability of committing a Type II error).

[5]*Ibid.*, p. 56.

the "amount of increase in sample size necessary to make test B as powerful as test A."[1] Or, put another way, "comparing the power of one test with that of a second test which acts as a standard and most often is the most powerful test for the conditions under which the comparisons are made" (and, clearly, when both statistics test the same null hypothesis).[2] A power-efficiency, when delineated for a statistical test, is given in percent and compared to the more powerful test known of its type.[3] The notion of power is aimless in relation to the χ^2 test for nominal data, in as much as it is used either when no alternatives exists or in order to discern relationships.[4] The K-S, when compared to the t-test, has a power efficiency of about 96 percent for small samples which tends to decrease slightly as sample size increases.[5]

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[1]Siegel, p. 20.

[2]Bradley, p. 57.

[3]Siegel, p. 21. The formula for test B when A is the most powerful known test of its type is: Power-Efficiency of Test B = (100) $\frac{Na}{Nb}$ percent where Na = is the sample size for Test A, and Nb = is the sample size for Test B. Example: Test A, N = 20 cases, Test B, N = 25. Power Efficiency of B is 80 percent, 100 ($\frac{20}{25}$) which means that in order to equate the power of test A and B we need to draw 10 cases of B for every 8 cases of A.

[4]Siegel, p. 110.

[5]*Ibid.*, p. 136.

The M-W when compared to the t-test has a power-efficiency close to 95 percent, and it approaches 95.5 percent as N increases.[1] The K-W, compared with the F-test, has a power-efficiency of 95.5 percent.[2] It should be remembered that the statistical model is germane to this discussion in that "in order to avoid having to make some of the statistical assumptions of the parametric tests," we can choose a different test with a larger N and retain equivalent power to reject H_o.

RESEARCH HYPOTHESES[3]

The "null hypothesis" is a hypothesis of no difference usually formulated for the express purpose of being rejected in order that the alternative form may be accepted.

The research hypotheses for this study, stated in null form, are as follows:

H_o:1 There is no difference in the assignment[4] to Levels of Care on the basis of the sex of the patient.

H_o:2 The assignment to Levels of Care on medical nursing units is not different from that on

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[1] Ibid., p. 126. Where K-S is more powerful for small samples, the M-W is more powerful for larger samples.

[2] Siegel, p. 193.

[3] The hypotheses now stated in the null form H_o have been stated in alternative form H_1 in Chapter I.

[4] Assignment refers to number of patients in each level and not individual assignment to a level which is an objective assessment.

surgical nursing units.

H_o:3 There is no difference in the assignment to Levels of Care among medical nursing units.

H_o:4 There is no difference in the assignment to Levels of Care among surgical nursing units.

H_o:5 There is no difference in the assignment to Level of Care on the basis of nursing units which have nursing students and those that do not.

H_o:6 There is no difference in the assignment to Levels of Care on the basis of types of accommodation occupied by patients.

H_o:7 There is no difference in the assignment to Levels of Care on the basis of the age of patients.

H_o:8 There is no difference in the assignment to Levels of Care on the basis of the marital status of patients.

H_o:9 There is no difference in the assignment to Levels of Care on the basis of marital status and sex of patients.

H_o:10 There is no difference in the assignment to Levels of Care on the basis of marital status, age, and sex of patients.

GUIDE FOR USE OF THE TABLES

The objective of this portion is to acquaint the reader with the structure of the tables in the Appendices in relation to each of the statistical tests applied. The explanations of the tables are sequenced in terms of levels of measurement (nominal, ordinal and interval). The ability to grasp and interpret the findings presented in the format of the tables illustrated here is important if the reader is to make maximum use of similar types of tables included in the Appendices. As an aid to interpretation of the data, crucial sections of the major tables are reproduced and discussed; a brief explanation as to how to relate the different tables for the same independent variables is then given.

THE TABLES: ILLUSTRATIONS

NOMINAL

EXAMPLE 1 = CHI SQUARE χ^2.

Table[a]

	COUNT I ROW PCT I COL PCT I TOT PCT I	L E V E L I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
AGE Under 20	1.00 years				
21-35	2.00 years				124 15.7
36-50	3.00 years		129[j] 70.9[k] 22.1[l] 16.3[m]		182[c] 23.0[d]
51-65	4.00 years				
66-80	5.00 years				
Over 80	6.00 years				
COLUMN TOTAL		92 11.6	583[e] 73.7[f]	116 14.7	791[g] 100[h]

CHI SQUARE = 19.57820 WITH 10 DEGREES OF FREEDOM[i].

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[a]The table numbers and titles are the first items cited. EV or File indicates the specific investigator and is followed by First, Second, Third or Total which pertains to the three sub-samples and the total data-producing sample. The specific table heading follows starting with the

independent variable, (X), by the dependent variable (Y) and reads "AGE, BY LEVEL OF CARE." The data from which this example was drawn is fully presented under Table 52 in Appendix A, p.245. On the left side of the table is the column representing the independent variable in question, in this example the "age" of the patient. In this case, the independent variable is broken down into five categories, one in each row, e.g., Row 1.00: patients under 20 years, Row 2.00: patients 21-35 years, etc. In the three column titles along the top of the table, the dependent variable, "Level," indicates the Level of Care Assessment classification. E.g., 15 patients in Row 2.00 (21-35 years) were classified into Level I; this represents 18.1 percent of all the patients in that age category, 35.9 percent of all the patients in Level I, and 4.2 percent of the total number of patients studied. A guide to the sequence of reading the data in each cell is given in the upper left hand corner. Count = number of patients; Row Pct = the percentage of the Row Total; Col Pct = the percentage of the Column Total; and Tot Pct = the percentage of the total. At the bottom of each table is the Chi-square (χ^2) value and the number of degrees of freedom. The χ^2 value is compared with values in "Table of Critical Values of chi-square; and probability under H_0 (null hypothesis) that χ^2 value is greater than or equal to the critical value in the table is determined, at a chosen level of significance, example:

df	.10	.05	.02	.01	.001
10	15.99	18.31	21.16	23.21	29.59

The above excerpt is taken from Table 14 of Akrin and Colton, Tables for Statisticians 2nd Edition, Barnes and Noble, Inc., New York, p. 126. Thus, for our example, the Chi-square value of 19.58 is between the values required for the .05 and .02 levels of significance, indicating that it lies between the 5 and 2 percent level of significance, when the null hypothesis H_0 of no difference is rejected and one would accept the alternative hypothesis H_1 of a difference in the dependent variable "Level" related to the independent variable "Age" of the patients. Fisher's Exact test value is given when it is appropriate (two samples small in size) and this value is the exact probability, e.g., .05 or .10.

[b]Denotes the age category of patients.

[c]The number of patients in that age category.

[d]The percentage of patients in that age category.

[e]The number of patients in any column, in the case in Level II.

[f]The percentage of patients in any column, e.g., Level II.

[g]The total number of patients studied.

[h]The percentage of patients studied is rounded to 100%.

[i]The Chi-Square value and degrees of freedom for the table, or the test value most appropriate for samples.

[j]Each cell in the table gives four points concerning patients studied. Studied: The number of patients in that category, the row percent, column percent and total percent. In this case, "j" denotes the number of patients in "age" category and "level" classification. E.g., 129 patients in age category of 36-50 years are in Level of Care II. The other three points are listed in footnotes k through m.

[k]The number (129) represents 70.9 percent of the Row Total (182) patients in age category 3.00.

[l]22.1 percent of the column total (583), e.g., 129 patients in category 3.00 are 22.1 percent of all the patients in Level of Care II.

[m]These patients (129) are 16.3 percent of all the patients studied (791).

ORDINAL

EXAMPLE 2 = KOLMOGOROV-SMIRNOV.

Table[a]

TOTAL SEX[b] (1 = M, 2 = F) K-S[c]

NUMBER OF OBSERVATIONS = 791[d]
NUMBER OF ITEMS = 1[e]
NUMBER OF RESPONSE CATEGORIES = 3[f]
NUMBER OF GROUPS = 2
FORMAT OF DATA (15 X .F1 = 0. T9 . 11)

ITEM	MEAN[g]	S.D.[h]
1	1.95	0.53
1	2.10	0.48

FREQUENCY[i]

1	1	64	276	46
1	2	28	307	70

ITEM 1 FOR GROUP 1 and GROUP 2 DMAX = 0.097[j] NI[k]=386
N2[l]=405

CHI SQUARE = 7.38728[m]

---

[a]The data from which this example is drawn is presented in full under Table 65, "Total Sex, K-S," Appendix B, p. 259.

[b]The independent variable: 1 = male, 2 = female.

[c]K-S = Kolmogorov Smirnov, i.e., name of the statistical test being applied.

[d]Total number of patients studied.

[e]Dependent Variable, Levels of Care.

[f]Denotes the three Levels of Care.

[g]Mean of Item 1, Levels of Care for the breakdown of the two samples, with the one denoted as 1 in this case males first and 2 in this case females underneath.

[h]Standard deviation of Item 1, Levels of Care for the same breakdown as (g).

[i]Frequency = the number of patients in each of the three Levels of Care, e.g., (64) males in Level I and (28) females.

[j]DMAX = maximum absolute value of the differences between the two samples cumulative distribution.

[k]N1 = number in group 1 of the independent sample, e.g., 386 male patients.

[l]N2 = number in group 2 of the independent sample, e.g., 405 female patients.

[m]Chi-square value which shows the probability associated with the observed value of DMAX and then you use the table to determine level of significance. The chi-square value (χ^2 for K-S is always considered to have 2 degrees of freedom for the K-S test. Degrees of freedom are computed by (r-1) (c-1) where r = rows, c = columns. Since the test is for two independent samples, males and females, r = 2, (2-1) = 1, and our dependent variable, "Levels," has three categories, C = 3, (3-1) = 2. Therefore, the degrees of freedom (df) equal 2. The critical values of chi-square with 2 df are:

.10	.05	.02	.01	.001
4.60	5.99	7.82	9.21	13.82

The above 2df excerpt is taken from Table C, S. Siegel, p. 249. The χ^2 value of 7.39 is between the critical values at the 5 and 2 percent levels of significance and therefore allows for the rejection of the H_0 (null hypothesis) of no difference.

EXAMPLE 3 = MANN-WHITNEY U-TEST.

Table [a]

```
FIRST SEX[b] (1 = F, 2 = M) M-W[c]

NO. OF FORMAT CARDS = 1[d]
NO. OF OBSERVATIONS = 267[e]
NO. OF INPUT VARIABLES = 1[f]
TOTAL NO. OF VARIABLES = 1[g]

SPECIFICATIONS FOR THIS PROBLEM
    NO RANK CORRELATIONS
    MANN-WHITNEY U-TEST BETWEEN SUCCESSIVE GROUPS -
      SMALLER GROUP FIRST
    NO COEFFICIENT OF CONCORDANCE
    DATA IS UNRANKED
    DATA INPUT FROM CARDS
    (15x, F1.0)

    NO. IN GROUP 1 = 133[h]   NO. IN GROUP 2 = 134[i]

MANN-WHITNEY U's and NORMAL DEVIATES 'POS' INDICATES
THE GROUP HAVING THE HIGHER RANKS

    VARIABLE[j]     U[k]        Z[l]      POS[m]

        1       6754.500    -4.254    1
```

[a]The data from which this table is drawn is presented in full under Table 68, "First Sex, M-W" Appendix B, p. 264.

[b]The independent variable, in this case, sex, where 1 = female, 2 = male.

[c]M-W = Mann-Whitney, abbreviated name of the test.

[d]The number of cards used to program the test.

[e]Total number of patients studied.

[f]Dependent variable 1, Levels of Care.

[g]Denotes the number of independent variables.

[h]Number of female patients = 133 (1 = F).

[i]Number of male patients = 134 (2 = M).

[j]Variable 1 = dependent variable.

[k]The value of U (determined by applying the formula: [$U = (n_1)(n_2) + n_1 (n_1+1)/2 - R_1$], where n_1 = Group 1, n_2 = Group 2, R_1 = sum of ranks (assigned to group whose sample size is n_1). R_2 = (sum of ranks to group whose sample size is n_2). (Siegel, p. 120).

[l]When U is known the value of Z is determined by substituting in formula (Siegel, p. 123):

$$Z = \frac{U - \frac{n_1 n_2}{2}}{\sqrt{\frac{(n_1)(n_2)(n_1+n_2+1)}{12}}}$$

When n_2 20, the probability associated with U is determined by computing Z and using "Table of Probabilities Associated with Values as Extreme as observed values of Z in the Normal Distribution." Thus in this example Z = -4.254. To use the table (which gives one-tailed probabilities, to be doubled for two-tailed) the left hand column gives values of Z to one decimal place and the top row gives various values to second decimal place. (Siegel, p. 247). The largest number is 4.00 and therefore p = .00003 (.00006 for two-tailed).

[m]'Pos' indicates group having higher ranks; Group 1 = female patients.

EXAMPLE 4 = <u>KRUSKAL-WALLIS ONE WAY ANALYSIS OF VARIANCE BY RANKS</u>

Table [a]

```
SECOND MEDICAL WARDS ONLY,[b] SPECIFIC WARD (5-8) K-W[c]

NUMBER OF FORMAT CARDS =   1
NUMBER OF OBSERVATIONS = 127[d]
NUMBER OF INPUT VARIABLES = 1[e]
TOTAL NO. OF VARIABLES = 1
SPECIFICATIONS FOR THIS PROBLEM
    NO RANK CORRELATIONS
    KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
    NO COEFFICIENT OF CONCORDANCE
    DATA IS UNRANKED
    DATA INPUT FROM CARDS
    (15X, F1.0)

NUMBER OF GROUPS = 4[f]
    GROUP NUMBER    1    2    3    4
    NO. IN GROUP  29.  31.  35.  32.

KRUSKAL-WALLIS ANALYSIS OF VARIANCE

VARIABLE  H[g]    DF[h]  SUMS OF RANKS[i]
    1     1.562  3.00  1977.50 1940.50 2149.00 2061.00
```

---

[a]The data from which this table is drawn is presented in full under Table 89, "Second, Medical Wards, K-W" Appendix B, p. 283.

[b]The independent variable, Medical Wards only. Specific Wards (5) to (8) are shown in the list of Value Labels for Ward (nursing unit), p.

[c]K-W = Kruskal-Wallis, abbreviated name of the test.

[d]Total number of patients studied.

[e]Dependent variable 1, Levels of Care.

[f]Number of Medical Wards 4, the number of patients on each ward listed for each group 1 to 4.

[g]Computed value of the H statistic used in the K-W test and defined (Siegel, p. 185) by formula:

$$H = \frac{12}{N\ (N+1)} \sum_{j=1}^{K} \frac{R_j^{\,2}}{n_j} - 3\ (N+1) \text{ where } K = \text{number}$$

of samples (4), n_j = number of cases (29) in jth sample (Siegel, p. 249), (Σn_j)N = number of cases in all samples combined 127, R_j = sum of ranks in jth sample 1977.50, K = $\sum_{j=1}^{k}$ sum of all of the ranks,(directs one to sum over the K samples, j = 1). H is distributed as chi-square with df = K-1 where n_j=5 and the probability associated may be determined by reference to "Table of Critical Values of Chi-square."

[h]Degrees of freedom for use in determining the level of significance: df = K-1 (4-1) = 3.

[i]Sums of ranks. Each of the N observations are replaced by ranks and the sum of the ranks in each column is determined. The K-W test determines whether these sums of ranks are from the same population in order to reject H_o at the level of significance for the H statistics (Siegel, p. 185).

EXAMPLE 5 = SPEARMAN RANK CORRELATION COEFFICIENT R_s (rho)

Table[a]

```
EV TOTAL SPEARMAN RHO[b] MEDICAL WARDS ONLY[c] (1=LEVEL OF
                                                   CARE,
                                            2=NSTUDENT)[d]
NUMBER OF FORMAT CARDS =    1
NUMBER OF OBSERVATIONS =  389[e]
NUMBER OF INPUT VARIABLES = 2
TOTAL NO. OF VARIABLES =    2[f]
SPECIFICATIONS FOR THIS PROBLEM
    SPEARMAN RANK CORRELATIONS
    NO TESTS OF SIGNIFICANCE
    NO COEFFICIENT OF CONCORDANCE
    DATA IS UNRANKED
    DATA INPUT FROM CARDS
    (15X, F1.0,T38,F1.0)
K
KSPEARMAN RHOS (BELOW DIAGONAL) AND T-RATIOS (ABOVE
                                                 DIAGONAL)
K            1          2
J
  1                 1.525002[h]
  2  [g]0.077288
DEGREES OF FREEDOM = 387[i]
```

[a]The data from which this table is drawn is presented in full under Table 111, "Total, Spearman RHO" Appendix B, p. 305.

[b]Abbreviated name of the test. R_s and RHO are used interchangeably for this statistic (see Siegel, pp. 202-213). In Chapter III, we use the R_s representation.

[c]The sample to be correlated: Medical wards.

[d]The variables for which relation is to be established. 1 = Level of Care, 2 = NStudents. This test will establish the relationship between Levels of Care, on medical wards only, with nursing students and those without nursing students.

[e]Total number of patients studied.

[f]Number of variables to be ranked and correlated.

[g]The R_s or RHO value, i.e., the correlation between variables 1 and 2.

[h]The t value associated with the R_s value determined by formula: $t = r_s \sqrt{\frac{N - 2}{1 - r_s{}^2}}$ for N = 10, with df = N-2 (N= number of observations). The significance of the t value is determined by use of a table of Critical Values of t (Siegel, p. 212). In this example t = 1.525002 df ∞ p = .05 level (1.960).

[i]Degrees of freedom N-2 (389-2) = 387 computed for use with the t tables. However, after df = 120 the table has df = ∞ [387].

INTERVAL

EXAMPLE 6 = <u>THE t-TEST</u>

Table[a]

```
EV TOTAL SEX(c) (1=M,2=F) T-TEST(d)

NUMBER OF FORMAT CARDS =   1
NUMBER OF VARIABLES    =   1(e)
NO.OF OBSERVATIONS IN GROUP 1 = 386(f)
NO. OF OBSERVATIONS IN GROUP 2= 405
(15X,F1.0)
    MEANS-TOTAL(g)

         1
1     2.030
    STANDARD DEVIATIONS-TOTAL(h)

         1
1     0.512
    CORRELATIONS-TOTAL(i)
         1
1     1.000
T-TESTS
 VARIABLE XBAR1 XBAR2 SDEV1 SDEV2 DF(j)  T(k)     P-ONE
                                                  TAIL(l)
     1     1.95  2.10  0.53  0.48  789. -4.169 0.0000170

                                                  P-TWO
                                                  TAIL(m)
                                                  0.0000340
F TEST-DIFFERENCES BETWEEN VARIANCES(n)
 VARIABLE VAR1 VAR2 DF1  DF2  F     P-NONDIRECTIONAL

     1     0.28 0.23 385. 404. 1.223 0.0456479
WELCH T PRIME APPROXIMATION ON VARIABLES(b)
 VARIABLE D.F.   T PRIME P-ONE TAIL P-TWO TAIL

     1     772.05 4.16    0.0000     0.0000
```

[a]The data from which this table is drawn is presented under Table 124"Total Sex, T-Test" Appendix C, p. 319.

[b]The Welch T Prime Approximation on Variables is included as printed by computer but was not referred to for this study.

[c]The independent variable, (1=F, 2=M).

[d]The name of the test: T-Test.

[e]The dependent variable, Levels of Care Variable 1.

[f]Group 1 = female patients (386), Group 2 = male patients (405).

[g]Mean of 791 patients (total) for Dependent Variable 1.

[h]Standard deviation of 791 patients (total) for Variable 1.

[i]Correlations between Levels of Care for 791 patients (total).

[j]DF = degrees of freedom (N - 2) where N = number of patients studied (total).

[k]T value computed (-4.169).

[l]P-One tail is the level of significance for the one-tailed test of the t value.

[m]P-Two tail is the significance level for the two-tailed test of the t value.

[n]F-test computed and the P-NONDIRECTIONAL is the significance level of the F value. This is included as it computed and it shows the representativeness of data producing sample.

EXAMPLE 7 = ANOVA, F-TEST

Table[a]

```
NUMBER OF VARIABLES   1^b
NUMBER OF GROUPS      3^c
NUMBER OF FORMAT CARDS  1
NUMBER OF INDIVIDUALS IN EACH CELL:^d

       267    260    264

(15X.F1.0)

Variable 1

Group  Number   Mean^e  Variance^f  S.D.^g

  1    267      2.1348 0.2825      0.5315
  2    260
  3    264

Total  791      2.0303 0.2620      0.5119

HOMOGENEITY OF VARIANCE TEST CHISQ^h = 2.0256
                       PROBABILITY^i= 0.3632

ANALYSIS OF VARIANCE

    Source        SS      MS     DF   F^j     P^k
    Groups  0.447E01  2.23     2  8.68  0.00017
    Error   0.202E03  0.26   788

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS^l
                             1      2      3
              MEANS      2.135  1.988  1.966

           3  1.966      0.169  0.023  0.0
           2  1.988      0.146  0.0
           1  2.135      0.0

              R     =      3      2

       The Multiplier is 0.03124^m
       See Winer, page 102
       Consult Table B4, p. 648 in Winer
```

---

[a]The data from which this table is drawn is presented under Table 142"Levels of Care by Sample" in Appendix E, p. 337. This table was chosen specifically because in the explanation, the tests for sample homogeneity can be pointed out,

equal valiance is assumed by ANOVA. Our sample is not presumed to be homogeneous in nature, but rather heterogeneous, with different patterns in Levels of Care. However, in the use of the selected variables X, a significant relationship between sample means for X is desirable.

[b]The dependent variable "Level of Care" Y.

[c]The independent variables, three samples X.

[d]The number of observations for each sample starting from the left, e.g., Sample 1 = 267 patients.

[e]The mean for each sample of the Level of Care variable: e.g., the mean for Sample 1 is 2.1348.

[f]Variance for each sample for the variable (Level of Care): e.g., the variance for Sample 1 is 0.2825.

[g]Standard Deviation from the mean for each sample for the Level of Care variable: e.g., S.D. for sample 1 = 0.5315.

[h]Homogeneity of variance, Chi-square Test, (χ^2) is the test for relationship of variance about the mean for the three samples.

[i]Probability of the χ^2 value or level of significance.

[j]Computation of the F-value 8.68, 2df.

[k]Probability or significance of the F-test p = .00017 (which is very significant). Significance on this H_o indicates the means differ.

[l]Newman-Keuls is the test used to determine the significance of relationship between two samples.

[m]This figure is used to compute the significance levels of the computed values for the above test. The multiplier is 0.03124 in this case. The computer print-out indicates that further explanation is supplied in Winer, p. 102, and that the significance table to be consulted is cited in Winer, p. 648. Newman-Keuls comparison between ordered means was very important when considering the uniform distribution of Levels of Care between the three samples:

	Level					
788df	.95	3.31	2.77	r	3	2
	.99	4.12	3.64		0.12870	0.11371
	r	3 steps			0.10340	0.08653
			2 steps		$(\bar{X}_1-\bar{X}_3)$	$(\bar{X}_2-\bar{X}_3)$

The multiplier was .03124, and thus for

$r = 3$ .05 $3.31 \times 0.03124 = .1035$ $r = 2$ .05
$(\bar{X}_1 - \bar{X}_3)$ .01 $4.21 \times 0.03124 = .129$, and for $(\bar{X}_2 - \bar{X}_3)$ .01

$2.77 \times 0.03124 = 0.0865$
$3.64 \times 0.03124 = 0.1137$. From the figures in our table and those provided above the significance levels between the three samples were

Levels	Samples 1	2	3
3	***	N.S.	--
2	***	--	
1	--		
Steps	3	2	

*** Indicates very significant, N.S. = Not significant. This test shows a significant difference beyond the 1 percent level between the means of samples 2 and 1, and 3 and 1 but no difference at 5 percent level between samples 2 and 3.

EXAMPLE 8 = PEARSON PRODUCT MOMENT CORRELATION COEFFICIENT R

Table[a]

EV TOTAL PEARSON R[b] (1=SEX, 2=AGE, 3=WARD TYPE, 4=LEVEL OF CARE, 5=NSTUDENT)[c]

NUMBER OF INDIVIDUALS = 791[d]
NO. OF VARIABLES INPUT = 5[e]
NO OF VARIABLES GENERATED = 0
TOTAL NO. OF VARIABLES = 5[e]

NFMT = 1   IDKR20 = 0   IPRB = 1

INPUT FORMAT CARD(S)
(8X,2F1.0,2X,F1.0,2X,F1.0,21X,F1.0)

MEANS[g]

	1	2	3	4[f]	5
1				2.030341	

STANDARD DEVIATIONS[h]

	1	2	3	4	5
1				0.512221	

CORRELATIONS[i]

	1	2	3	4	5
1				0.146618	
2				0.093572	
3				0.151981	
4				1.000000	
5				0.028207	

T-VALUES ASSOCIATED WITH R'S[j]

	1	2	3	4	5
1				4.163360	
2				2.639930	
3				4.319178	
4				0.0	0.792616
5				0.792616	

PROBABILITIES OF T'S[k]

	1	2	3	4	5
1				0.000038	
2				0.008556	
3				0.000020	
4				0.0	
5				0.429666	

---

[a]The data from which this table is drawn is presented in full in Table , "Total, Pearson R" in Appendix C, p.

[b]The name of the test, Pearson R.

[c]The variables to be correlated. Our interest is in the relationship between 1=sex, 2=age, 3=ward type, 5= N Students and 4=Levels of Care.

[d]Total number of patients studied.

[e]Total number of variables.

[f]Variable 4 = Levels of Care, the dependent variable, and we are interested in the correlations R, T-values associated with R, and Probabilities of T's in this column 4. E.g., the correlation of 1=sex with 4=Levels of Care is 0.268221, the T-value is 4.163360, and the probability is 0.000038 (level of significance).

[g]Means. E.g., the "1" represents age in relation to Levels of Care.

[h]Standard deviation. E.g., "3" represents ward type in relation to Levels of Care.

[i]Correlation Coefficient R between and among pairs of variables.

[j]T-values associated with R's for the pairs of variables.

[k]Probabilities (levels of significance) associated with t-values for each pair of variables.

RELATING THE TABLES

The relationship between tables is necessary to understand, in order to follow the presentation of findings and analysis of data as related to the research hypotheses. Comparisons of the findings from similar tests for different time periods, and from different tests for both the same and different time periods will be made throughout Chapter IV.

The composite tables of results which the investigator presents in Chapter IV relate the statistical levels of significance for each of the tests in the three levels of analysis for the three sub-samples and the total sample.

BY DATA COLLECTION

Comparisons will be made by data collection periods and the total sample. For example, Table 1 shows the division of patients by sex into Levels of Care for the first period, Table 15 shows the same for the second period, Table 28 for the third period, and Table 40 for the total sample of 791 patients. In comparing these tables we see there were 134 male and 133 female patients in the first period, 123 male and 137 female patients in the second period, and 129 male and 135 female patients in the third period. These numbers comprise a total of 386 male and 405 female patients in our total sample of 791 patients. The levels of significance for each of the chi square tests can also be compared by use of tables in statistical texts or by use of the composite tables

of results.[1] The other tests can be compared in the same way for each data collection period and the total sample. Similarly, the K-S test shows the divisions into Levels of Care by sex that can be compared to the nominal table for the same variable and time period. For example, Table 54 shows the divisions for first time period, which can be compared to nominal Table 1 for the same period. The chi square value is used to determine the significance level and these findings can also be compared between tests and between data collection periods. From Table 7 , we can see the division of males: Level I=21, Level II=93, and Level III=20, and can see that these same numbers appear in K-S Table 54. The totals for N_1 males and N_2 females are 134 and 133 respectively, as in Table 54. The M-W test, Table 68, shows the same group divisions as does the K-S test in Table 54 and each of the other tests for the same data collection period. The significance levels for each test can be determined, as was previously explained in the section illustrating the use of the tables.

BY TESTS USED

Tables can also be compared by tests used for the same and for different time periods, as well as with the total sample. Thus, K-S tests for the first period can be compared to K-S tests for the second, and/or third periods.

---

[1]These tables are in Chapter IV and they present significance levels up to .10 (10 percent) level of significance.

Table 59 , K-S test, comparing Levels of Care by sex can be compared with Table 65 , the same test for the same independent variable, for the total sample. The levels of significance may be determined as outlined in the illustrations for the different tests. Comparisons by tests will also be made throughout Chapter IV and, although Table 2 , presents in composite form the results of all the tests by levels of significance, it is useful for the reader to be able to verify these results from the original tables.

Having explained the methodology underlying the study, we now turn to the presentation and analyses of the findings.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

The findings relevant to the focus of this study are presented in detail in tables in the Appendices.[1] In this Chapter, discussion of the findings, insofar as possible, follows the sequence in which the analysis took place, this being based upon the order in which the variables appear in the research hypotheses.[2] Tables 2, and 13 to 17, present the results in terms of significance levels of statistical tests used, major variable, and data collection period. The investigator has organized the presentation of her findings and her analyses of them under the headings of (analysis by): (1) Research Hypotheses, (2) Data Collection Period, and (3) Elements of Direct Nursing Care. She then presents an overall discussion. The intent of this Chapter is to facilitate assessment of her findings.

BY RESEARCH HYPOTHESES

The following analysis is sequenced to permit dis-

---

[1]The Appendices are divided according to the levels of data analysis. See p.191 for a detailed explanation of the sequence of presentation.

[2]Listed on p. 77 in Chapter III "Methodology."

cussion of the research hypotheses[1] as they relate to the independent variables. The research hypotheses were stated in Chapter I in the positive form and in Chapter III in the null form. The nominal level of measurement was used initially for each variable in order to discern if relationships existed between these variables and the Levels of Care data. For this analysis of Levels of Care data,[2] it is considered that an optimum choice of statistical test is that of (ordinal) non-parametric statistical tests for rejecting H_o, when it should be rejected.[3] The ordinal techniques were employed, then, even though the results of some of the nominal tests were not significant. Comparisons were then made between results of the statistical techniques, for the ordinal level of measurement and for the interval level of measurement. Power-efficiency of the M-W as related to the t-test is about 95 percent, and for the K-W as related to the F-test, the power-efficiency is 95.5 percent. The probability of a Type I-error is 5 percent, and thus decreasing the level of significance would increase the potential magnitude of a Type II-

---

[1]The sequences in which the research hypotheses are discussed is in terms of the variable headings (e.g., sex, age) used in Chapters I and III. It will be recalled, (p.76) that the investigator has selected the .05 level of significance for accepting null hypotheses.

[2]Ordinal level of measurement is considered to meet with assumptions underlying the data.

[3]Siegel, p. 20.

TABLE 2 [1]

COMPARISONS OF STATISTICAL SIGNIFICANCE,
BY STATISTICAL TEST, MAJOR VARIABLE, AND PERIOD

Major Variable[2]	By Period	Level of Significance, by Test. χ^2	K-S	M-W	K-W	R_s	T	F	R
SEX	1	***	*	***	NA	***	***	NA	***
	2	NS	NS	NS	NA	NS	NS	NA	NS
	3	NS	NS	NS	NA	NS	NS	NA	NS
	T	***	**	***	NA	***	***	NA	***
WD TYPE Medical/Surgical (Med.) (Surg.)	1	**	NS	**	NA	**	**	NA	**
	2	***	**	*	NA	*	*	NA	*
	3	***	*	***	NA	***	***	NA	***
	T	***	***	***	NA	***	***	NA	***
MEDICAL WDS Among 5,6,7,8	1	***	NA	NA	*	NA	NA	*	NA
	2	NS	NA	NA	NS	NA	NA	NS	NA
	3	*	NA	NA	NS	NA	NA	NS	NA
	T	***	NA	NA	**	NA	NA	**	NA
SURGICAL WDS Among 1,2,3,4	1	***	NA	NA	***	NA	NA	***	NA
	2	**	NA	NA	***	NA	NA	***	NA
	3	NS	NA	NA	NS	NA	NA	NS	NA
	T	***	NA	NA	***	NA	NA	***	NA
N. STUDENTS Yes 1 No 0	1	*	NS	**	NA	**	**	NA	**
	2	NS	NS	NS	NA	NS	NS	NA	NS
	3	NC[3]	NC[3]	NC	NA	NC	NC	NA	NC
	T	NS	NS	NS	NA	NS	NS	NA	NS
AGE	1	NS	NA	NA	NS	NS	NA	NS	NS
	2	NS	NA	NA	*	*	NA	*	**
	3	*	NA	NA	NS	**	NA	NS	**
	T	*	NA	NA	***	**	NA	***	***

TABLE 2 [1] (continued)

Major Variable[2]	By Period	χ^2	K-S	M-W	K-W	R_s	T	F	R
MARITAL	1	NS	NA	NA	**	NA	NA	**	NA
	2	*	NA	NA	*	NA	NA	*	NA
	3	**	NA	NA	**	NA	NA	**	NA
	T	NS	NA	NA	**	NA	NA	**	NA
ACCOM	1	NS	NA	NA	NS	NA	NA	NS	NA
	2	NS	NA	NA	NS	NA	NA	NS	NA
	3	NS	NA	NA	NS	NA	NA	NS	NA
	T	NS	NA	NA	NS	NA	NA	NS	NA
MED WDS/	1	NS	NS	*	NA	NS	*	NA	*
N STUDENTS	2	NS	NS	NS	NA	NS	NS	NA	NS
Yes 1	3	NC[3]	NC[3]	NC[3]	NA	NC[3]	NC[3]	NA	NC[3]
No 0	T	**	NS	NS	NA	NS	NS	NA	NS
SURG.WDS/	1	NS	NS	NS	NA	NS	NS	NA	NS
N STUDENTS	2	NC+	NC+	NC+	NA	NC+	NC+	NA	NC+
Yes 1	3	NC[3]	NC[3]	NC[3]	NA	NC[3]	NC[3]	NA	NC[3]
No 0	T	NS	NS	NS	NA	NS	NS	NA	NS
SAMPLE/PERIODS	T	***	NA	NA	NC	NC	NA	***	***
SAMPLE/MED/SURG.	T	NS	NC	NA	NC	NC	NA	NC	NC

Level of Significance, by Test.

Legend

*** indicates .001 - .01 level of significance.
** indicates .01 - .05 level of significance.
* indicates .05 - .10 level of significance.
N.S. indicates beyond .10 level of significance.
N.C. indicates not computed.
N.C.+ indicates not sufficient numbers in N.Students=0.
N.A. indicates not applied or not applicable.

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[1]Abbreviated names used for variables as on page 77, also abbreviations used for statistical tests as in illustrations, and data collection periods are denoted by 1, 2, 3, T (Total).

[2]Major variable refers to independent variable.

[3]Third period all wards had N students therefore no tests performed.

error.[1]

SEX OF PATIENTS

H_o:1 There is no difference in Level of Care assignment on the basis of sex of the patients.

Table 2 shows the results by levels of significance, for each variable and statistical test employed. The critical value of χ^2 [2] in the analysis of the total data producing sample by sex was 20.26[3] (2df), which was significant beyond the .001 level. The Z value of M-W test was -4.10, (p. 00003), which was also a highly significant level. On the basis of analysis by these tests, there was a statistically significant difference in Levels of Care on the basis of the sex of the patients. Therefore H_o: of "no difference" can be rejected.

In comparison, the t-value for the variable sex was -4.17 (p. TWO TAIL, 0.00003), which is far beyond the .001 level of significance. The results of this test are comparable with the (M-W) ordinal test, (95% P-e), which is an appropriate test in terms of the character of Levels of Care data; the T value would also allow for H_o to be rejected.

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[1]Power-efficiency, Type I error and Type II error were discussed in Chapter III. Hereinafter Power-efficiency will be used in both the full term and an abbreviated form P-e.

[2]Abbreviations used in Tables and presented earlier will be used for statistical tests.

[3]Critical values for χ^2, Dmax, Z, H, T, F, R_s, and R, are presented to the fifth decimal place in tables and are rounded to the second decimal place for this analysis.

However, in terms of the assumptions underlying data, the optimum choice for rejecting the null hypotheses are results of the ordinal tests.

In that evidence exists of differences in assignment[1] to Levels of Care between male and female patients, and statistical significance accepted, it would seem to be wise to consider the coexistence of differences in assignment to Levels of Care among patients of the same sex. The chi-square test was used to examine this question which, put in the form of a "null hypotheses," would be a subset of H_o:1 regarding the sex of patients, i.e., H_o:1A "There are no differences in the Level of Care assignment among patients of the same sex.

FEMALE PATIENTS

The 405 female patients, by assignment to Levels of Care were, subdivided, controlling for Sex. When employing statistical techniques and controlling for the variable Sex, the nominal test was considered most appropriate.[2] The critical value of χ^2 for female patients[3] by marital status and

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[1]"Assignment" refer to distribution among the three Levels as explicated in Chapter I.

[2]As stated in Fox, p. 68, "the nature of the nominal data serves a naming or categorizing function," and there is nothing in the variable "Sex" that allows ordering.

[3]This division by Levels of Care is presented on pp. 353 to 412.

Levels of Care, was 5.33 (10df), $p >$[1] .80 (6.18) for the first data collection period; 6.81 (10df), $p < .80$ (6.18) for the second period; and 6.64 (8df), $p < .70$ (5.53) for the third period. The critical value of χ^2 for the total data producing sample was 6.41 (10df), $p < .80$ (6.18).[2] These results indicate that there was "no difference" in Levels of Care assignment among female patients, and H:o would not be rejected.

In Table 16 which depicts marital status, controlling for Sex and Age, the χ^2 values for females were also not significant.

MALE PATIENTS

The 386 male patients, for the same variable subdivisions as for females, i.e. controlling for Sex and employing nominal techniques, presented an entirely different result. The critical value of χ^2 for male patients by marital status and Levels of Care,[3] was 16.11 (8df), $p < .05$ (15.51) for the first data collection period; 18.30 (8df), $p < .02$ (18.17) for the second period; and 16.10 (8df), $p < .05$ (15.51) for the third period. The critical value for the total data producing sample was 19.74 (8df), $p < .02$ (18.17). These values were

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[1]Carat, $>$ "greater than" or $<$ "less than" used to show closest significance level presented in the respective tables used for critical values.

[2]See Table 166, Appendix D, p. 362.

[3]See Appendix D, p. 361.

certainly significant beyond the .05 level, and indicate that there was "a difference" in Levels of Care assignment among male patients; thus $H:_o$ would be rejected.

In Table 16 which depicts marital status controlling for Sex and age, the χ^2 values for males was significant to .05 level for males between 51-65 years.

The differences in assignment to Levels of Care existing between the sexes, then, could have been influenced by the great difference in assignment to Levels of Care <u>among</u> the male patients. Female patients regardless of age or marital status seem to have provided less variability in distribution among the Levels.

TYPE OF NURSING UNIT

It will be recalled that we studied patients on medical and surgical nursing units only. Levels of Care comparisons were made between patients on medical and surgical units, and also amongst medical patients within the four medical units and amongst surgical patients within the four surgical nursing units. Nursing units that had nursing students were compared with those that did not, and specific units (medical or surgical) with and without nursing students were also compared.

> H_o:2 The Levels of Care assignment of patients on medical nursing units is not different from that of the patients on surgical nursing units.

All the statistical techniques employed resulted in values that were significant beyond the .001 level (p=13.82).

The results were as follows:

Table 3[1]

CRITICAL VALUES AND SIGNIFICANCE LEVELS, BY WARD TYPE

	Nominal	Ordinal		Interval		
Statistical Test	χ^2	K-S	M-W	Spearman R_s	T-test	Pearson R
	χ^2	DMAX	U	R_s	T	R
Critical Values	(31.86)	(0.142)	(67456.)	(0.154)	(-4.33)	(0.15)
	——	χ^2	Z	T	F	T
	(-)	(15.92)	(-4.331)	(4.382)	(1.608)	(4.32)
	P	P	P	P	P	P
Probabilities	(.001)	(.001)	(.001)	(.00001)	(.00001)	(.002)

There was, therefore, a significant difference in assignment to Levels of Care amongst medical and surgical patients, thus the $H:_o$ can be rejected in terms of all three levels of analysis. However, as in H_o:1, the investigator is rejecting it on the basis of the ordinal tests[2] because they are consonant with the characteristics of the data. The critical value of χ^2 for Ward Type by sample collection period[3] was 0.03 (2df), p. $>$ .98 (.04), and shows "no difference" in medical and surgical patients for the total data producing

[1]Tables for each test are presented fully in the Appendices, p. 190. The results reported above in Table 2 are for total data producing sample: N1 MEDICAL=389, N2 SURGICAL=402, N=791.

[2]M-W, P-e = 95 percent.

[3]I.e., the "Sample" is the dependent variable, see Table 158, Appendix D, p. 354.

sample, nor amongst the three sub-samples.[1] The results, then, indicate that the assignment to Levels of Care between medical and surgical patients was comparable for samples 1, 2, and 3 respectively.

AMONGST MEDICAL UNITS

> H_o:3 There is no difference in the assignment to Levels of Care amongst medical nursing units.

There were 131 (49.1%) medical patients in the first period and 127 (48.8%), 131 (49.6%), patients for the second and third periods respectively. The total number of medical patients studied was 389 (49.2%). The division into Levels of Care for each of the four medical units for the total sample of medical patients was as follows:

Table 4[2]

MEDICAL PATIENTS, BY LEVEL OF CARE

Medical Ward Value Labels	Levels of Care				
	I ONE	II TWO	III THREE	TOTAL	%
5	6	77	8	91	23.4
6	6	79	7	92	23.7
7	25	69	10	104	26.7
8	11	87	4	102	26.2
Total	48	312	29	389	100.0
	(12.3)	(80.2)	(7.5)		

[1]See Tables 2, 16, 29 , Appendix A, pp. 195,209 and 222 respectively.

[2]Figures in brackets denote percentage distributions. See Table 42, Appendix A, p. 235.

The values for the statistical tests employed in relation to the data in Table 4 are cited below:[1]

Table 5

CRITICAL VALUES AND SIGNIFICANCE LEVELS, MEDICAL NURSING UNITS

Statistical Test	Nominal χ^2	Ordinal K-W	Interval F-Test
Critical Values	χ^2 (22.68 (6df)	H (9.45 (3df)	F (3.06)
Probabilities	p ($<$ .02)	p ($<$.02)	p (0.03)

The results of the all statistical tests reported in Table 5 above are significant beyond the .05 level, and thus the null hypothesis of "no difference" is rejected.[2] Thus there is a difference in assignment to Levels of Care among medical nursing units.

AMONGST SURGICAL UNITS

H_O:4 There is no difference in the assignment to Levels of Care among surgical nursing units.

The patients on four surgical units were studied. The divisions into Levels of Care for these units are presented in the Appendices for each[3] period and the total

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[1]It will be recalled that the term "WARD" is used on computer tables to denote "Nursing Units."

[2]P-e = 95.6 percent for the K-W test as compared to the F-test.

[3]Pp.197, 211, and 224 respectively.

sample of surgical patients.[1] It should be remembered that these surgical units were not separated into surgical specialties such as urology and opthalmology. There were some overflow patients from an orthopedic unit on to one male unit, but these were considered minor orthopedic cases and were treated as any minor surgical case, or equivalent to general surgical patients.

There were 136 (50.9%) surgical patients in the first period with 133 (51.2%), and 133 (50.4%) surgical patients in each of the second and third periods. Thus, there was a total of 402 (50.8%) surgical patients studied. The division of data into Levels of Care for each period and for the total sample was as follows:

Table 6

SURGICAL PATIENTS, BY LEVEL OF CARE[2]

Data Collection Sample	Levels of Care				
	I ONE	II TWO	III THREE	TOTAL	%
FIRST	10	88	38	136	50.9
SECOND	20	87	26	133	51.2
THIRD	14	96	23	133	50.4
Total	44	271	87	402	50.8

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[1]See p. 236.

[2]See Tables 4, 18, 31, pp. 197, 211, and 224 respectively.

The critical values for the statistical tests employed in relation to Table 6 data showed the following results:

Table 7[1]

CRITICAL VALUES AND SIGNIFICANCE LEVELS, SURGICAL NURSING UNITS

	Nominal	Ordinal	Interval
Statistical Test	χ^2	K-W	F-Test
Critical Values	χ^2 (27.49 (6df)	H (24.58 (3df)	F (8.59)
Probabilities	p (< .001)	p (< .001)	p 0.00002

The results for the statistical analytical techniques employed among surgical nursing units, were in all cases significant beyond .001 level, and the null hypothesis of "no difference" was therefore rejected. There is a highly significant difference in assignment to Levels of Care among surgical nursing units.

NURSING UNITS WITH NURSING STUDENTS AND WITHOUT NURSING STUDENTS[2]

H_o:5 There is no difference in assignment to Levels of Care on the basis of nursing units which have nursing students and those that do not.

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[1]Tables for each test are presented fully in the Appendices, pp. 193-351.

[2]The codes "0" and "1" are used to denote "without" and "with" respectively. For the third data collection period all nursing units had nursing students, so there were no comparisons made between "with" and "without."

The critical values for the tests employed among nursing units which had nursing students and those which did not yielded the following results:

Table 8[1]

CRITICAL VALUES AND SIGNIFICANCE LEVELS, BY NURSING STUDENTS

Statistical Test	Nominal	Ordinal		Interval		
	χ^2	K-S	M-W	Spearman R_s	t-Test	Pearson R
Critical Values	χ^2 (0.81)	DMAX (0.02)	U (57183)	R_s (0.08)	T (0.794)	R (0.02)
	-	χ^2 (0.39)	Z (-0.80)	T (0.80)	F (1.060)	T (0.793)
Probabilities	p (.70)	p (.80)	p (>.21)	p (<.21)	p (0.43)	p (0.43)

The above results show clearly that the hypothesis of "no difference" would be accepted at .05 level of significance. The nursing units <u>with</u> nursing students do not differ in assignment to Levels of Care from those nursing units without students.

The nursing units were further examined, by medical nursing unit (only) and surgical nursing units (only), with and without nursing students. The results are summarized below:

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[1]See Tables 5, 19, and 32 on pp.198, 212, and 225 respectively.

Table 9[1]

CRITICAL VALUES AND LEVELS OF SIGNIFICANCE

		Nominal	Ordinal			Interval	
	Statistical Test	χ^2	K-S	M-W	Spearman R_s	t-Test	Pearson R
MEDICAL	Critical Values	χ^2 (615(6df)	Dmax (0.07)	U (15912.)	Rs (-0.078)	T (1.57)	R (0.08)
		—— (-)	χ^2 (1.69)	Z (-1.52)	T (-1.53)	F (1.41)	T (1.51)
	Probabilities	p (.05)	p (.50)	p (.06)	p (.20)	p (0.12)	p (0.12)
SURGICAL	Critical Values	χ^2 (0.93)	Dmax (0.50)	U (10409)	R_s (0.047)	T (0.95)	R (0.04)
		(-)	χ^2 (0.54)	Z (0.95)	Z (0.95)	F (1.03)	T (0.94)
	Probabilities	p (.70)	p (.80)	p (.46)	p ($<$.20)	p (0.35)	p (0.35)

The χ^2 value for the medical units was found to be significant to the .05 level, but the remaining tests were not significant. The null hypothesis of "no difference" was accepted, as the ordinal statistical tests did not allow for $H:_o$ to be rejected.

In all cases, statistical tests applied to the surgical unit data were found not to be significant, thus the $H:_o$ of "no difference" was accepted.

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[1] See Appendix A, B, and C respectively for the twelve tests shown.

ACCOMMODATION OCCUPIED

H_O:6 There is no difference in the assignment to Levels of Care on the basis of the type of accommodation occupied.

The type of accommodation (bed status) of each patient was examined to compare the division of or assignment to Levels of Care for patients occupying the three types of accommodation available on the nursing units studied. There was a total of 159 (20.1%) patients occupying private rooms[1] (these were distributed into: 16 Level I patients, 117 Level II, and 26 Level III patients). Patients occupying semi-private accommodation were compared regarding their assignments to Levels of Care. There were 258 (32.6%) patients occupying semi-private rooms in the total sample: 25 of the patients were in Level I, 193 in Level II, and 40 in Level III. The patients occupying the ward[2] type of accommodation totalled 374 (47.3%). There were 51 in Level I, 273 in Level II, and 50 in Level III.

The results of the statistical tests employed for the variable ("ACCOM") by Levels of Care were as follows:

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[1]Some private rooms, usually one on each nursing unit were used for isolation cases, terminal patients, patients who disturbed others, and for other special reasons, regardless of the patient's admitting status or ability to pay. These patients were not separated for the study and were treated as private room patients.

[2]The largest bed capacity of a ward on the nursing units studied was four beds.

Table 10[1]

CRITICAL VALUES AND LEVELS OF SIGNIFICANCE, BY TYPE OF ACCOMMODATION

	Nominal	Ordinal	Interval
Statistical Test	χ^2	K-W	F-Test
Critical Values	χ^2 (3.39(4df)	H (2.92(2df)	F (1.48)
Probabilities	p (.50)	p ($<$.20)	p (0.23)

The results for this variable are not significant at the .05 level and therefore the null hypothesis of "no difference" was accepted. There was, then, no difference in the assignment to Levels of Care on the basis of type of accommodation[2] occupied by the patients.

AGE OF PATIENTS

H_O:7 There is no difference in assignment to Levels of Care on the basis of the age of the patients.

The patients were divided into six age categories, and assignments of patients by Level of Care in each of these categories of age were then examined.[3] The under 20 year

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[1]See Appendices A, B, and C.

[2]The value labels, or categories, for this variable are P=Private, S.P.=Semi-Private, and W=Ward.

[3]The distribution of patients by age categories is presented fully in the tables in the appendices, and for purposes of brevity only the statistical results will be presented in this discussion. Table 11 p. 130shows results by age, and Table 16 p. 138shows the multivariable breakdown by age.

(1.00) age category had the smallest(N) number of patients. It should be remembered that patients up to the age of 14 years were admitted to pediatrics, insofar as possible.

The results of the statistical tests employed for the variable ("AGE") by Levels of Care were as follows:

Table 11[1]

CRITICAL VALUES AND LEVELS OF SIGNIFICANCE, BY AGE

	Nominal	Ordinal		Interval	
Statistical Test	χ^2	K-W	Spearman	F-Test	Pearson
Critical Values	χ^2 (19.58 (10df)	H (16.09 (5df)	R_s (0.09) T (2.72)	F (3.29)	R (0.09) T (2.64)
Probabilities	p (0.05)	p (<.01)	p (<.01)	p (0.006)	p (0.008)

All of these results were significant beyond the .05 level, and the null hypothesis of no difference was then rejected, i.e., there was a difference in the assignment to Levels of Care on the basis of the age of the patients.

Patients were further subdivided by age, marital status, and sex and results of the nominal tests employed are presented in Tables 13 to 17 , as well as in Appendix D. The analytic results will be discussed in following sections of the chapter.

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[1]See Appendices A, B, and C.

MARITAL STATUS OF PATIENTS

H_o:8 There is no difference in the assignment to Levels of Care on the basis of the marital status of the patients.

The results of the statistical tests employed for the independent variable marital status, Levels of Care were as follows:

Table 12[1]

CRITICAL VALUES AND LEVELS OF SIGNIFICANCE, BY MARITAL STATUS

	Nominal	Ordinal	Interval
Statistical Test	χ^2	K-W	F-Test
Critical Values	χ^2 (14.49(10df)	H (10.64(4df)	F (2.70)
Probabilities	p (.10)	p ($<$.02)	p (0.03)

The χ^2 value for the marital status of patients was not significant at the .05 level. However, since the K-W ordinal test, appropriate for the data, <u>was</u> significant at the .05 level, the null hypothesis of "no difference" was safely rejected. There was, then, a difference in the assignment to Levels of Care on the basis of the marital status of the patients.

[1]See Appendices A, B, and C.

TABLE 13[1]

STATISTICAL SIGNIFICANCE OF NOMINAL TESTS,
SEX BY MARITAL STATUS

Specific Factors[2]	Categories			Nominal Test[3]
Sex by Marital	Sex	Marital	By Period	χ^2/FEP
	M=1 F=2	1.00 Married	1	***
			2	NS
			3	NS
			T	***
		2.00 Single	1	NS
			2	NS
			3	NS
			T	NS
		3.00 Widowed	1	NS
			2	NS
			3	NS
			T	NS
		4.00 Divorced	1	NS
			2	NS
			3	NS
			4	NS
			T	NS
		5.00 Separated	1	*
			2	NS
			3	NS
			T	**
		6.00 Other	1	NC
			2	NC
			3	NC
			T	NC

[1]Tables 3 through to 16 use the same legend as Table 2, p.115. They are all crosstabulations of multi-factor analysis.

[2]"Specific Factors" refer to the independent variables.

[3]Nominal tests applied were chi square of Fisher's Exact Probability.

Table 14[1]

STATISTICAL SIGNIFICANCE OF NOMINAL TESTS, MARITAL BY SEX

Specific Factors	Categories			Nominal[2]
Marital by Sex	Sex	Marital	By Period	χ^2/FEP
	1 Male	All 1-5 categories	1	**
			2	**
			3	**
			T	**
	2 Female	All 1-6 categories	1	NS
			2	NS
			3	NS
			T	NS

[1]This division is presented fully on pp. 355-362. The chi square value for males was significant beyond .05 level (5% level) for each period, whereas females' chi square values were significant only at the .90, .80, and .70 respectively for the three periods. The level of significance for the total sample for males was significant beyond the .02 level ($p < .02$, 18.17) whereas for females it was less than the .80 level ($p < .80$, 6.17).

[2]Nominal tests were chi square or Fisher's Exact Probability.

MARITAL STATUS AND SEX

H_O:9 There is no difference in the assignment to Levels of Care on the basis of marital status and sex of the patients.

The results of the chi square test employed for sex, by Level of Care, and controlling for marital status, are shown, by significance levels, in Table 13, page 132; those for marital status, by Level of Care, controlling for sex, are shown by level of significance in Table 14, page 133.

In the tests controlling for marital status, married and separated patients show statistically significant differences to the .05 level in Levels of Care.

The tests for marital status, controlling for sex, show male patients to present statistically significant differences to the .05 level in assignment to Levels of Care, whereas females did not show significant differences.

In view of the results of the above tests one would reject $H:_O$, and accept that some differences to the .05 level did exist in assignment to Levels of Care on the basis of marital status and sex. Further, since these variables (sex and marital status) are limited in that they do not allow "ordering," only the nominal test was considered appropriate for the multivariate analysis.

MARITAL STATUS, SEX, AND AGE

H_O:10 There is no difference in assignment to Levels of Care on the basis of marital status, sex, and age of the patients.

The results by levels of significance for divisions of patients by marital, sex and age are presented in Tables 13 to 17 , (pages 132 to 140). The tables for the total data producing sample are included in Appendix D.

In viewing the results for these subdivisions, there are some tests which were significant to .05 level. Also when the sex, age, and marital status of the patients were treated separately, the results were statistically significant at the .05 level. The null hypothesis of "no difference" was therefore rejected, and a difference in assignment to Levels of Care on the basis of marital status, sex and age of the patients was considered to have existed. Since the numbers of observations (N) in some of these subcategory breakdowns were quite small, the significance levels above .05 level could be due to the differences "caused" by sex and age which were very significant when (N) was increased.

TABLE 15[1]

STATISTICAL SIGNIFICANCE OF NOMINAL TESTS,
SEX BY MARITAL BY AGE

Specific Factors	Categories				Nominal[2]
Sex by Marital by Age	SEX M=1 F=2	AGE Number ( )	MARITAL # Name	By Period[2]	χ^2/FEP
		Under 20 yrs. (1.00)	1 Married	T	NC+
			2 Single	T	NS
			5 Separated	T	NC+
		21-35 yrs. (2.00)	1 Married	T	NS
			2 Single	T	**
			4 Divorced	T	NS
			5 Separated	T	*
			6 Other	T	NC+
		36-50 yrs. (3.00)	1 Married	T	**
			2 Single	T	NS
			3 Widowed	T	NS
			4 Divorced	T	NS
			5 Separated	T	NS
		51-65 yrs. (4.00)	1 Married	T	NS
			2 Single	T	NS
			3 Widowed	T	NS
			4 Divorced	T	NS
			5 Separated	T	NS
		66-80 yrs. (5.00)	1 Married	T	NS
			2 Single	T	NS
			3 Widowed	T	NS
			4 Divorced	T	NS
			5 Separated	T	NS

TABLE 15-continued

Specific Factors	Categories				Nominal[2]
Sex by Marital by Age	SEX M=1 F=2	AGE Number ( )	MARITAL # Name	By Period	χ^2/ FEP
		Over 80 yrs. (6.00)	1 Married	T	NS
			2 Single	T	NC+
			3 Widowed	T	NS
			5 Separated	T	NC+

[1]Results are reported for the total sample only. Period results which differ from total results are discussed in the text only if the difference appears to be related to other than a small N factor. (The symbol NC+ indicates a sample too small for calculation).

[2]Chi square of Fisher's Exact Probability.

TABLE 16

STATISTICAL SIGNIFICANCE OF NOMINAL TESTS, MARITAL BY SEX BY AGE

Specific Factors	Categories				Nominal[1]
Marital by Sex by Age	Sex 1 Male	Age # Name	Marital # Name	By Period	χ^2/FEP
		1 Under 20	2 Single	T	NC
		2 21-35 yrs	1 M[2]	1	NS
			2 S	2	*
			4 D	3	NS
				T	NS
		3 36-50 yrs	1 M	1	NS
			2 S	2	NS
			4 D	3	NS
				T	NS
		4 51-65 yrs	1 M	1	NS
			2 S	2	NS
			3 W	3	NS
			5 Sep	T	**
		5 66-80 yrs	1 M	1	*
			2 S	2	NS
			3 W	3	NS
			4 D		
			5 Sep	T	NS
		6 Over 80yrs	1 M	1	NS
			2 S	2	NS
				3	NS
				T	NS
	2 Fe-male	1 Under 20yrs	1 M		
			2 S	T	NS
		2 21-35 yrs	1 M	1	NS
			2 S	2	NS
			4 D	3	NS
			5 Sep	T	NS

TABLE 16-continued

Specific Factors	Categories			By Period	Nominal[1] χ^2/FEP
Marital by Sex by Age	Sex 2 Female	Age # Name	Marital # Name	By Period	χ^2/FEP
		3 36-50 yrs	1 M	1	*
			2 S	2	NS
			5 Sep	3	NS
				T	NS
		4 51-65 yrs	1 M	1	NS
			2 S	2	NS
			3 W	3	NS
			4 D	T	NS
		5 66-80 yrs	1 M	1	NS
			2 S	2	NS
			3 W	3	NS
				T	NS
		6 Over 80yrs	2 S	1	NS
			3 W	2	NS
				3	NS
				T	NS

[1]Nominal test was chi square of Fisher's Exact Probability.

[2]Abbreviated form only used with code number, e.g., 1M=married, 2S=single, 5Sep=Separated.

TABLE 17

STATISTICAL SIGNIFICANCE OF NOMINAL TESTS, AGE BY MARITAL BY SEX

Specific Factors	Categories				Nominal
Age by marital by Sex	Sex	Age	Marital	By Period	χ^2/FEP
	1 Male	No.of Values	No.Name		
		5	1 Married	1	*
				2	NS
				3	NS
				T	NS
		5	2 Single	1	NS
				2	NS
				3	NS
				T	NS
		3	3 Widowed	1	NS
				2	NS
				3	NS
				T	NS
		3	4 Divorced	1	NS
				2	NC
				3	NS
				T	NS
		2	5 Separated	1	NC
				2	NS
				3	NS
				T	NS
	2 Female	5	1 Married	1	NS
				2	NS
				3	NS
				T	NS
		5	2 Single	1	NS
				2	NS
				3	NS
				T	NS

TABLE 17--continued

Specific Factors	Categories				Nominal
Age by marital by Sex	Sex	Age	Marital	By Period	χ^2/FEP
	2 Female	No.of Values	No.Name		
		4	3 Widowed	1	NS
				2	**
				3	NS
				4	*
		3	4 Divorced	1	NC
				2	NS
				3	NS
				4	NS
		2	5 Separated	1	NS
				2	NS
				3	NS
				T	NS

BY DATA COLLECTION PERIODS

It will be recalled that the presentation and analysis of the data in this Chapter is organized around three foci: research hypotheses, data collection period, and elements of direct nursing care. We will now turn to the second of these. Prior to dealing with the data in terms of the data producing samples *per se* (i.e., the total sample and the three sub-samples), we will first describe the Levels of Care distribution in terms of the relationship amongst the three sub-samples, comparisons of obtained patterns vis-à-vis "expected" patterns, and sub-sample distributions of the medical and surgical patients.

It will also be recalled that there were three data collection periods in the data collection sample. Table 18 presents the number of patients in each Level of Care, by data collection period.

From Table 18 we see that the total sample (791) is comprised of 267 (33.8%) patients in sample one; 260 (32.9%) in sample two; and 264 (33.4%) in sample three. Ninety-two (11.6 percent) of these 791 patients were placed in the Level I category. There were 583 patients (73.7 percent) in Level II, with 86 of these in Level II Extended (10.9 percent).[1] The remaining 116 patients (14.7 percent) were in Level III.

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[1]Table 217 in Appendix E shows the breakdown: 497 patients, 62.8% in Level II, 86 patients, 10.9% in Level IIE.

TABLE 18[1]

LEVELS OF CARE, BY DATA COLLECTION PERIOD

	COUNT ROW PCT COL PCT TOT PCT	SAMPLE DATA COLLECTION PERIOD 1.00	2.00	3.00	ROW TOTAL
LEVEL OF CARE I ONE	1.00	22 23.9 8.2 2.8	34 37.0 13.1 4.3	36 39.1 13.6 4.6	92 11.6
II TWO	2.00	187 32.1 70.0 23.6	195 33.4 75.0 24.7	201 34.5 76.1 25.4	583 73.7
III THREE	3.00	58 50.0 21.7 7.3	31 26.7 11.9 3.9	27 23.3 10.2 3.4	116 14.7
	COLUMN TOTAL	267 33.8%	260 32.9%	264 33.4%	791 100.0%

The dependent variable in our tests is most frequently "Level of Care." Another quite important concern in our study is the relationship between the X variable and the Y (Level of Care). The chi square test was used in evaluating the relationship between Levels of Care assignment, by sample

[1]E.g., there were 22 patients in Level I in the first period (23.9 percent of all patients in Level I) which constituted 8.2 percent of the patients in period one, and 2.8 percent of all patients (791) in the sample.

collection periods.[1] In this case, the chi square value was 18.73 (4df), which is significant beyond the .001 level. A significant difference in the Levels of Care assignment of the total sample (i.e. among) data collection samples was evident.

The Newman Keuls comparison between ordered means[2] shows there is a difference beyond the .01 level between sample one and samples two and three respectively. Samples two and three do not differ at the .05 level of significance. We can, therefore, assume that sample one differs significantly from the other two in the assignment to Levels of Care of the patients studied. The investigator has indicated that she assumes variability in the sample distributions by Levels of Care through her choice of ordinal statistics for determining significance, it was considered acceptable to use all three data collection samples for the study, i.e., it was still considered to be a "representative" sample of the medical and surgical patients.

In each sampling period, the assignment was compared

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[1]Table 157, Appendix D, p.353; in this case Levels of Care is X and Sample Periods are Y. Chi square values in the tables are given to fifth decimal, rounded to second for this chapter. Patients were assigned to their respective Level of Care using the instrument discussed earlier, following this the statistical techniques were applied using the X and Y variables.

[2]TableEX7 in Chapter III, page 105, illustrates this test and it is explained in Winer, B.J., Statistical Principles in Experimental Design (New York: McGraw-Hill Book Co., 1962), p. 102, as referred to in computer print out.

to the percentage distributions found by the previous users of the tool.[1] Table 19 depicts this comparison, in percentage figures, for each data collection period and for the total sample. In order to examine the variation in the "expected" patterns vis-à-vis the obtained patterns, these findings are presented below:

TABLE 19

OBTAINED DISTRIBUTIONS OF LEVELS OF CARE, BY SAMPLE PERIODS, VERSUS "EXPECTED"[2]

Level of Care	Sample Period Percentages				
	1.00	2.00	3.00	Total	"Expected"
I ONE	8.2	13.1	13.6	11.6	9 - 12
II TWO[3]	70	75	76.1	73.7	70 - 75
III THREE	21.7	11.9	10.2	14.7	10 - 15
TOTAL %	99.9	100	99.9	100	89 -102

The data relating to the separation of patients as to type of nursing unit, i.e., as to medical and surgical units, for the three periods is presented in Table 20. We

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[1]Previous users of the tool were MacDonell et al (see "Timing Studies" p. 134); Federal Nursing Consultants (N.D.H. W.) also make use of these percentage distributions.

[2]"Expected" distributions in this table refer to those defined by MacDonell et al in the above footnote.

[3]Level IIE (Two Extended) were patients in Level II, hospitalized 30 days or over. The division of 73.7% Level II patients consisted of 62.8% in Level II and 10.9% in Level Two Extended, as compared with a distribution of 5-10% in Level II Extended reported by MacDonell et al.

find 131 medical, and 136 surgical patients in the first period; 127 medical, and 133 surgical in the second period; and 131 medical, and 133 surgical in the third period.

TABLE 20

PATIENTS ON MEDICAL AND SURGICAL NURSING UNITS, BY SAMPLE COLLECTION PERIOD

WD TYPE	COUNT ROW PCT COL PCT TOT PCT	SAMPLE COLLECTION PERIOD 1.00	2.00	3.00	ROW TOTAL
MEDICAL UNITS	1.00	131 33.7 49.1 16.6	127 32.6 48.8 16.1	131 33.7 49.6 16.6	389 49.2
SURGICAL UNITS	2.00	136 33.8 50.9 17.2	133 33.1 51.2 16.8	133 33.1 50.4 16.8	402 50.8
	COLUMN TOTAL	267 33.8	260 32.9	264 33.4	791 100.0

Of the 791 patients in the data-gathering sample, 389 were medical patients (49.2 percent) and 402 were surgical (50.8 percent). Within the total of 389 medical patients, there were 48 in Level I, 312 in Level II, and 29 in Level III. The division for the 402 surgical patients shows 44 in Level I, 271 in Level II, and 87 in Level III. The results of the χ^2 test for medical and surgical patients by data-collection periods were presented earlier, and indicated that the assignment to Levels of Care was comparable for the three

sub-samples.[1]

Crosstabulations were done for each of the independent variables and combinations of more than one independent variable. The results of the various tests for each of these variables are shown in Tables 2 through to 16, by levels of significance. The individual results by data collection period, by variable, and by statistical techniques employed are presented in the Appendices. The multivariable nominal statistical tests are presented in Tables 13 to 17 for each data collection period, and only those for the total data producing sample are presented fully in the Appendix.

We will now turn to the results of the statistical tests for the total data-producing sample and each of the three sub-samples.

TOTAL DATA-PRODUCING SAMPLE

The total sample showed significant levels at the .05 level, where the three samples taken individually often did not, since the sample size (N) was larger. Tables 2, and 3 to 17 show the levels of significance, by variable and statistical technique, for the total sample, T. These can be compared to the tables for each sample period. Table 15 shows results for the total sample only, and differences in other periods will be pointed out here, as well as in the

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[1]See p. 121.

sections related to the hypotheses by variables. Married patients between the ages of 21 and 35 years had a chi square value of 10.49 (2df) $p < .01$ (9.20) in the third period but were N.S. for the other two periods. Married patients between ages of 36-50 years had a chi square value (14.40, 2df), significant to .001 level for the first period and to .05 level for the total sample (chi square value 7.77, $p < .05$ (5.99)). Married patients between 51 and 65 years showed a chi square value of 6.81 (2df), significant at the .05 level (5.99) for the second period, and those patients, married, and between 66 to 80 years showed χ^2 value 4.93 (2df) to the .10 level (4.60) for the first period. These findings can be related to the levels of significance found for marital status and age in Table 2, for the χ^2 test and other more powerful tests. There were some of these multivariable tests, as in Table 15, that were not significant until the N (sample size) was increased, and could therefore not be computed for the other periods, not only because of lack of sufficient sample size but because at times all the patients in a given category were in same Levels of Care. The findings on single patients between 21 and 35 years were significant to the .05 level for the total sample but N.S. for the three individual sample tests. Separated patients in the same age category (2.00) as above showed significance to the .10 level only for the total sample. Table 14 shows that males in the five marital categories had a significant chi square value for each individual sample, and the total sample was signi-

ficant to the .05 level, whereas females showed a chi square value not significant (NS) to the .10 level for <u>all</u> samples. Table 13 which presents results for both sexes, by marital status, shows a significance level to the .001 for the total sample. Since the largest number of patients falls into the married category (522 patients), this probability can be assumed to be quite accurate. The data results as reported for the total sample are presented fully in the tables in Appendix D. These results show that Levels of Care assignment is different by: sex, ward type (which relates to type of patient), among wards of the same type, and by age and marital status. Nursing students and accommodation show no difference to the .10 level of significance. It should be remembered that "Levels of Care" relates to nursing activities centered around the patient, as required by individual patients. The weighted values for each item listed on the instrument are related to average times required to give that care. These new findings of difference relate Levels of Care to the <u>characteristics</u> of patients, e.g., age, medical, surgical, etc., and types of nursing units.

FIRST PERIOD

In the first data collection period, sex, ward type, specific wards (both medical and surgical) were, in terms of Levels of Care, all statistically significant at or beyond the .05 level, using the chi square (χ^2) or Fisher's Exact

Probability (F.E.P.) tests.[1] This means there is a .95 chance that there was a real difference in Levels of Care for each of these variables.

The K-S tests (i.e., ordinal) for this period showed no statistically significant difference to the .05 level for any of the independent variables and a .10 level of significance only for sex. The M-W tests, which are more powerful for ordinal data, showed sex to be significant to the .001 level; ward type to the .05 level; and nursing students[2] to the .05 level, (among) nursing units with or without nursing students. The K-W tests showed a statistically significant difference to .001 level between surgical wards and to the .05 level for the marital status of patients for this period. This test also, then, points to a difference in Levels of Care for these variables. The significance of R_s with a large sample determined by t-value shows sex to be significant to .001 level, ward type and nursing students were significant to .05 level for this period.

The interval tests used can be compared, by levels of significance, by use of Table 2. In examining this table we see they are comparable, almost exactly, in levels of significance to those found for comparable ordinal tests,

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[1]Abbreviations for tests will be used for these analyses.

[2]In the Tables, N Students refers to nursing units with or without nursing students whenever used. MED.WDS. refers to medical nursing units and SURG.WDS. to surgical nursing units.

e.g. M-W compared to T-test, K-W to F-test, and R_s to R. However, it should be remembered that a test is dependable only if it meets with the assumptions underlying the data. The power of the M-W test for ordinal data is an excellent substitute for the t-test, without the latter's restrictive assumptions.[1] This explains to some degree the comparability of results between groups of statistical tests, for two independent samples, or for k independent samples, and those tests for degree of relationship between samples (e.g., males and females, medical and surgical patients), those tests applied to patients of different ages and marital status, by their assignment to Levels of Care. The remaining data collection periods and sections of this chapter will be discussed, by reference to Tables 2, and 3 to 17, and specific tables in the Appendices.

SECOND PERIOD

Again, for the second data collection period, full tables are also presented in Appendices by order of each of the independent variables and statistical techniques used. By use of Table 2 one can examine, as for the first period, the levels of significance by each test used, and by levels of measurement for each test, e.g., nominal: χ^2, ordinal: M-W, and interval: t-test. It can easily be noted that as one proceeds to the more powerful tests, the results appear

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[1]Siegel, p. 126. Power efficiency for each test is discussed in Siegel. Also, power efficiency of statistical tests in general is discussed on p. 20 in Siegel.

to be fairly consistent. Also, comparable tests, such as M-W to t-test for different levels of measurement, yield somewhat similar results in levels of significance. Ward type is significant to the .001 level in χ^2 test, and to the .05 level in K-S, and for tests among surgical wards the level of significance is to the .05 level in χ^2, and to the .001 level in the K-W and F-test (ANOVA). Tests among medical wards are not significant to the .10 level for this period; neither are the tests for nursing students significant to the .10 level. Tables 13 to 17 show significance levels for the major variables, by categories of each of the specific factors.[1] The results for the data on male patients, by Level of Care, controlling for marital status, showed statistical significance to the .05 level, while the female data did not demonstrate significance even at the .10 level. So, for this period, male patients differed in their Level of Care assignment by marital status while females did not.

When we compare the first and second samples by variable and statistical tests, the results are statistically different in levels of significance for many of the tests. The investigator attributes this to the differences in assignment to Levels of Care for the two samples. This might also be due to the actual numbers of patients in the categorical divisions of each variable. Careful examination of the full

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[1]E.g., Major Variable-Age, Categories 1:00 to 6:00, Marital, Categories 1:00 to 6:00, Sex, Categories 1:00 and 2:00.

presentations in the Appendices will substantiate this point, especially in those cases where several categories of several variables were used. The total sample allows for an increased N (size of sample) and thus the power of the non-parametric tests is increased and probability statements (levels of significance $p \geqq .05$), according to Siegel's arguments, are "exact," regardless of the population from which the sample is drawn.[1] This then allows for acceptance of sample one and two although results differ for each sample.

THIRD PERIOD

In the third data collection period, all nursing units had nursing students, and therefore the tests between wards with and without Nursing Students were not computed (N.C.). Again, Table 3 shows that for ward type the level of significance was to the .001 level, except for K-S, which was significant to the .10 level. Age was significant to the .05 level for R_s and R, and to the .10 level for χ^2 test; and marital status was significant to the .05 level for all tests computed. Once more, in this period we see a difference in Levels of Care assignment by variables, and statistical techniques, and also a difference in results from those of samples one and two.

We will now turn to our third and final analytical focus, Elements of direct nursing care, before ending this chapter with an overall discussion.

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[1]Siegel, p. 32.

BY ELEMENTS OF DIRECT NURSING CARE

The elements of direct nursing care, as defined earlier,[1] are demonstrated in the Tables in Appendix E.

The method to determine the Levels uses the scores in each of the elements[2] and thus a variety of scores in A, B, and C were found for patients in each Level, but particularly in Level II and Level II Extended. The chi-square statistic was computed to discerne the relationship between the various scores in A, B, or C respectively and the Levels of Care, and also to test the null hypothesis that k independent samples have come from the same population with respect to the proportion of cases in the Levels. However, upon examination of this statistic with its large degrees of freedom, the results were considered to be meaningless. It is recommended that "for χ^2 tests with df larger than 1 (that is when either k or r is larger than 2), fewer than 20 percent of the cells should have an expected frequency of less than 5, and no cell should have an expected frequency of less than 1."[3] Thus, it is not feasible to try to interpret these results.

In examining each element, one main purpose is to

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[1]In Chapter I--Definitions, p. 7.

[2]MacDonell et al, Timing Studies, p. 133.

[3]Siegel, p. 178.

view the variations in the divisions into Levels of Care, by elements A, B, and C.[1]

In each Level (e.g., I, II, III) the patients' nursing care requirements present a continuum, or an "underlying continuity of the variable under study,"[2] but patients within each level can have a very wide range of scores in each of elements A, B, and C.

Upon further examination of the data related to the scores in elements A, B, and C, it is interesting to note the variations in the combinations of A, B, and C scores.[3] Further statistical tests[4] were carried out on the Levels

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[1]In the text in the following sections, the elements will be referred to as A, B, or C. Tables 217 to 219 present fully the numbers and percentages of patients with each score in the individual elements by each Level of Care including Level IIE (30 days and over in hospital). The use of the Levels of Care data, in regards to these elements is still considered to be ordinal data.

[2]Siegel, p. 31.

[3]Example:

Score	Level of Care (No. of Patients)				
0.0	I ONE	II NOT X	II EXTEN	III THREE	TOTAL
A	14	10	7	0	31
B	8	14	0	1	23
C	12	19	1	3	35

The above example shows the division of patients into Levels of Care with a zero score in A, B, or C. There were 14 patients with a zero scores in A in Level I, 8 with 0 in B, and 12 with 0 in C also in Level I. There were no patients with 0 score in B in Level IIE or with 0 score in A in Level III.

[4]There were four statistical tests performed: K-W, Spearman R, ANOVA-F test and Pearson r. The X variable for these tests was "Levels of Care," and the Y variable was the three "elements of direct nursing care."

of Care data in order to examine the relationships within and amongst the A, B, and C scores by the Levels of Care I, II and III. These tests were performed after the statistical analysis on the Levels of Care data for the selected variables and the three subsamples of the total data-producing sample was performed, but were computed for the total sample only. Tables for the four tests performed are to be found in Appendix E. In that all of the tests provide further evidence of statistical significance far beyond the .001 level, homogeneity of variance <u>within</u> A, B, and C cannot be assumed for each Level even though there is underlying continuity <u>within</u> the three "Levels of Care." The ANOVA-F test was computed for each element (A, B, and C) in terms of the three Levels of Care and the probability result for homogeneity of variance (chi square test) was 0.00, a finding which further provices evidence of the wide variations in the three Element scores in each of the Levels of Care. The presentation of findings, with respect to each Element will now be discussed.

CLINICAL MONITORING - A

The scores obtained for Element A of the Levels of Care data collection instrument ranged from 0 to 125. A score up to 207 was possible, should every item have been checked. The numbers of patients for each score in each Level of Care and the total number of patients with that particular score in Element A (Clinical Monitoring) are presented in Table 217, in Appendix E. For example, on page

414 we find there were a total of 129 (16.3%) patients with a score of 10 in A, 15 of these patients were in Level I, 83 in Level II, 8 in Level IIE,[1] and 23 in Level III. From the same table[2] we find that all patients with a score of over 45 in A were in Level III, a total of 41 patients. All Level I patients had a score of 10 or less in A, and there was a total of 92 in this group. The 116 patients in Level II, "Not X," had scores ranging from 0-42 in A; and the 86 in Level IIE had scores ranging from 0-30. The remaining 75 patients in Level III had scores ranging from 2-40 in A: 25 had scores from 30-42, and 50 had scores ranging from 2-30. These ranges of scores in A for each Level of Care provide evidence of the variations of care requirements within each Level of Care.

The table for Element A[3] shows 31 (3.9%) patients with scores of 0 in A; 14 of these patients were classified as Level I, 10 Level II, 7 Level IIE and none in Level III. Of the 183 (23.1%) patients with a score of 2.00 in A, there were 42 Leve I, 117 Level II, 21 Level IIE, and 3 Level III. As we proceed down the tables through higher scores, we find that for all scores above 45 in A, the patients are in Level

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[1]Level IIE refers to Level II Extended, defined in Chapter I as 30 days or over in hospital.

[2]Table 217 in Appendix E, p. 415.

[3]Table 217 in Appendix E, p. 414.

III only, which is in accordance with the MacDonell scale.[1] These scores are related to nursing care requirements, and a patient in Level III with a score of 25 in A would, indeed, differ from one with a score of 100 in A. Since A scores are one of the criteria used to classify Level III patients, as well as B scores, one could use comparative analysis between A and B scores for Level III patients. On the basis of gross comparisons from our tables, it can be seen that 4 out of 10 patients with a score of 30 in B are in Level III (2 each with scores of 31 and 32) 9 with scores of 33, 2 with a score of 46, and so on. Each group of these patients would have different requirements for nursing care. Not only do individual patients have different requirements, but groups of patients, in terms of Levels of Care classification, also have different care requirements by virtue of differing A, B, and C scores. On this basis one might well question the usefulness of analyses of Levels of Care data which do not include specific analyses of the A, B, and C components. The statistical tests performed[1] provide some analysis but only indicate degrees of variability and relationships between Levels of Care and "A scores."

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[1]MacDonell and others, Timing Studies, p. 151, and on p. in Chapter on methodology.

[2]Table 222 shows results of the ANOVA-F test, for Element A by the three Levels of Care for this analysis.

TECHNICAL NURSING - B

The scores obtained through Section B of the Levels of Care data collection instrument ranged from 0 to 52, with a score up to 149 possible if every item were checked. Table 218 in the Appendix E, presents the division of patients by Level of Care for each score in Element B, Technical Nursing.

There were 85 patients in Level III with B scores of 30 and over, 31 patients with scores between 0 and 28 in B in Level III, and 92 patients with scores of less than 5 in B in Level I. In Level II there were 497 patients with scores of from 0-30 in B, and 86 patients with B scores from 2-27 were in Level IIE. This examination presents further evidence of heterogeneity in relation to the Elements of Care. We can use scores in Element B comparatively with those in A for Level III patients and, as well, examine B scores for Level II and Level I patients. The two Level scores in B are useful individually, and further by comparative analysis with C scores for Levels II and I. By use of Table 218 in Appendix E, in going through from a score of 0.0 in B to 52.00 in B, we find the same underlying continuity as for A scores. All patients with scores of 30 and over in B are in Level III, which is in keeping with the MacDonell scale.[1] According to the procedure for categorization, Level I scores in B should

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[1]MacDonell and others, <u>Timing Studies</u>, p. 151.

not exceed a score of 5[1] and in C they should not exceed a score of 10. Level II patients present differences in B scores as well as C scores and, therefore, present differences in nursing care requirements.

NON-TECHNICAL NURSING - C

The scores in C ranged from 0 to 77, with a possible score of 125 if every item were checked. A complete presentation of the division of patients by Level of Care for each score in C is available in Appendix E, Table 219 (p. 420). This element of nursing care relates to basic nursing requirements related to personal care. There were 92 patients in Level I with scores of 10 or less for Element C; 497 patients in Level II with scores ranging from 0 to 70 in C; 86 in Level IIE with scores from 0 to 77; and 116 patients in Level II with C scores ranging from 0 to 74.

High scores in C, with low or zero scores in A and B would point to further need for investigation of the mix or group of patients. Tables for this Element, by Levels of Care, show how many patients with scores over 10 in C care in Level II and Level IIE. The range of scores for these two levels, although they also point to diversity in nursing care requirements for differing groups, are particularly useful, since

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[1]There was one known error in tabulation, since one Level I patient was reported with a score of 11 in B. This was such a small error (1 patient out of 791) that it was not changed, and patient remained categorized in Level II.

it is more likely that different types of nursing personnel (e.g., registered nurses, aides) become involved in this element of care. Comparative analysis for C and B scores for Levels I and II would show that patients with high scores in B as well as C, or high scores in only one of these, require different types of nursing care, and such findings could therefore facilitate more precise staffing assignment.

In this investigation of Elements of nursing care we have provided evidence as to the need for more precise examination of "Levels of Care" data, and shown that a significant difference exists between the scores in Elements A, B, and C for each of the three Levels of Care respectively.

In that the findings and their analyses with statistical interpretations have been presented, it would seem useful to provide some discussion of these statistical analyses as related to the research hypotheses, the data collection periods and the elements of direct nursing care. Such an overall discussion will now be provided.

DISCUSSION

It will be recalled that the problem for this research is comparative statistical analysis of Levels of Care data, using the selected variables. The central purpose is to evolve a valid statistical method for use with Levels of Care data on the basis of these same variables, in order to enhance the practice of nursing and ultimately improve patient care. It should be emphasized that "cause and effect"

are not applicable to the tests performed. The only inferences that can be made are that relationships exist between the variables and Levels of Care and that differences in the distributions among these Levels existed for the variables sex, type of nursing unit, amongst medical and amongst surgical nursing units, age, and marital status. There were no significant differences in the Level of Care distributions for the variables accommodation, or nursing students. Variability and thus significant differences existed in Levels of Care distribution for each of the sub-samples and the total data-producing sample. This discussion and the statistical analysis from which it stems cannot presume to provide answers which relate to the cause of the differences or lack of differences. The intent is only to suggest possible reasons for these results and to bring the reader back to the points made in the review of the literature.

In the review of average daily census and variability within the census, as McNally points out, the information regarding severity of illness within the census and other conditions pertaining to the particular hospital are important.[1] Insofar as variability is related to the medical patterns of care for various stages of an illness some nursing care requirements are dependent upon the orders of the physician, and others, the independent nursing activities relate to the comfort, physical, psychosocial, and

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[1]See p. 18.

spiritual or emotional, of the patient, thus it can be seen that the nursing care requirements will vary amongst groups of patients.[1]

In Jelinek's model of the major components of any patient care operation the "Output Factors" which were Patient care, Patient Satisfaction and Personnel Satisfaction are interdependent with the input, organizational, workload, and environmental factors.[2] The requirement for care of the patient is a dependent factor and determined in part, before the day the patient enters the hospital. The socialization patterns of the patient as Robinson points out as well as the patients background and characteristics can be useful in planning care.[3] Socialization patterns are considered to be related to the nursing care requirements of the patients. In that social expectations of males and females are not the same, their expectations of the treatment prescribed by the doctor and provided by the nurse may also be different and this reflected in the requirements as shown on the assessment forms regarding individual patients. In other words, the doctor may prescribe different care not only because the type of illness differs but his pattern of care may reflect what he sees as justified by differing

[1]See p. 11, which gives the definitions of dependent and independent nursing care.

[2]See p. 24.

[3]See p. 25.

expectations of his patients. The nurse, too, may find that the female or male patient, as may be reflected in our data, require patterns of nursing care dependent on their expectations, (e.g. there were more male patients in Level I than female patients), and it may be that females have a greater need to go home sooner because of greater family responsibilities.

Some authors in our review of literature reported that female patients nursing requirements differed from males in that females regarded personal grooming and toilet facilities as important and thus required more care time.[1] Such requirements can be seen as differences in basic nursing care items and could be suggested as attributable to the differences in assignments to Levels of Care between the patients of different sex. One must not forget biological and physiological functions which are applicable to sexes and also to age.[2] Mechanic and Jaco have many references which relate to the possible explanations for the differences (existing) in the distributions among the Levels of Care for the variables of sex, age, and marital status of patients. They also provide information related to psycho-social differences which arise in coping with illness which may provide some support for the differences found in the nursing care requirements for the characteristics, e.g., age, of the patients studied.[3] This study, in no way provides sufficient

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[1]See p. 43. [2]See p. 44. [3]See p. 44.

information regarding why or in what amounts these differences occured. We only know that there were statistically significant differences in the distribution of the Levels of Care in relation to the variables of sex, age and marital status.

It is interesting to note that the nursing units studied were not considered to provide differing services, (e.g. such as specialized nursing units as a coronary care unit), and the differences amongst patients on nursing units of the same type as well as between the medical and surgical patients all showed statistically significant differences in their distributions to Levels of Care. Differences were found by other researchers and were attributed to differences in individual patients,[1] as well as differences in requirements amongst groups of patients. It may be recalled that Pardee reported differences from unit to unit and attributed these differences to the difference in procedures and treatments. She also indicated that severity of illness is not necessarily equatable with nursing care required.[2] Such considerations are applicable to the nursing units in this study or more clearly to the patients on these units. The kind of care is indeed seen to differ within the Levels of Care and this is substantiated by the finding

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[1]See, p. 45.

[2]See, p. 46.

in elements of direct nursing care and was also cited as such by George and Kuehn.[1]

In terms of the findings of no significant differences among nursing units which have nursing students and those which do not, it could be pointed out that although the nursing time in relation to the nursing care requirement may differ in the presence or absence of students (particularly nursing students but would be applicable to other students on the nursing unit), the care requirement of the patients is not altered, at least not in our measurements of patients nursing care requirement. It was argued that the patient expects more or less depending upon who the provider of care is, but our findings point to no differences in requirements as measured by Levels amongst the patients regardless of the presence or absence of nursing students. Even when the wards were divided in to medical and surgical wards and then analysis carried out, the presence or absence of nursing students did not provide for any significant differences in the distributions in Levels of Care and therefore in the nursing care required as measured by our instrument. Thus as was referred to by Hatt and Wright that although students have an effect on the time spent in direct nursing care of the patients and possibly to the expectations of the patients, it does not appear to be related to any differences

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[1]See, p. 47.

in the Levels of Care distributions.[1]

It will be recalled that it was argued that the type of accommodation should be a function of nursing care requirement. Our finding of no statistically significant difference in the assignment to Levels of Care on the basis of this factor are similar to those of Gordon et al.[2] However, this finding of "no difference" does not permit us to assume that accommodation is not necessarily a function of nursing care requirement.Conversely, in the same study by Gordon et al, they found no significant differences in the assignments to Levels of Care on the basis of age and marital status. Age, as a patient's characteristic has been shown to be a factor which fundamentally is related to differences in nursing care requirements as cited by George and Kuehn, and Robinson.[3] Differences in Levels of Care on the basis of "age" have been found by others.[4] Our findings, too, point to this factor as being important in assessing nursing care requirements.

The fact that marital status has only been reported in Gordon et al, and in that our findings are the converse of theirs, we might look to the relationship of marital status with such things as life styles or socio-economic status, and sociological and psychological difference between patients in the different marital status categories.[5] Such

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[1]See, p. 47. [2]See, p. 48. [3]See, p. 50.

[4]See, p. 50. [5]See, p. 51.

factors may account for our findings of statistically significant differences in assignment of Levels of Care on the basis of marital status of the patients. Again in that our information did not provide for or require these particular answers we can only say that our findings point to differences in nursing care requirement on the basis of marital status. The findings in relation to the variables are seen to be of importance to the practice of nursing, in terms of the provision of care, and staffing, and also in future uses of the suggested statistical techniques.

In terms of the findings in relation to the variability amongst Levels of Care distributions for the three data collection periods, and amongst the total data-producing sample, this finding is crucial to the analysis of the data and the choice of a valid analytical method. Groups of patients are seen to have varying nursing care requirements based on the measurement of requirements of the individual patient; and thus an optimal and appropriate method for analysis requires statistical verification in relation to the assumptions underlying the data.

The findings in relation to the Elements of direct nursing care and their relationship to the Levels of Care, show that this more precise examination for the differences found in the distributions, could account for the differences by Levels of Care. The differences both in range and distributions of these elements for each Level of Care and amongst the three Levels was statistically significant.

Again, however, we would point out that no cause and effect can be concluded from the findings in this study.

The investigator regards that discussion relating to the overall results have provided ideas about the practicality of examining relationships between Levels of Care data and the variables selected. It is hoped that the results of this study will add to patient care information needed and provide some ways and means to use this information in order to improve ultimately the care of the patient.

The conclusions and recommendations pertinent to the researcher's task, the research question and also the main purpose of this study, that of evolving a method of statistical analysis of Levels of Care data, will now be presented.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations discussed in this last chapter are centered around three focal points: the comparisons of the statistical analytical techniques; the development of a statistical method to be of practical use in analysing Levels of Care data, and the relationships of the Elements of direct nursing care to Levels of Care.

CONCLUSIONS

The main conclusion arising from this study relates to the underlying research question posed in Chapter I: "Do differing statistical analytical treatments of Levels of Care data lead us to differing responses to the data-gathering questions posed in this study?" It is our conclusion that the results from simultaneous application of nominal, ordinal, and interval statistical techniques demonstrate that the responses to the questions posed do not differ. However, the acceptance of the probability statements do differ. The purposes of the various tests, and their specific underlying assumptions, and their "separate or distinct theories concerning each level of measurement,"[1] determine the meaning of

[1]Siegel, p. 22.

the probability statements.[1] Decisions made about hypotheses using parametric statistical techniques on data which do not have "equal intervals" are very tenuous indeed. Some of the other assumptions such as homoscedasticity (equal variance) required for use of parametric statistics often can only be presumed and not proven: Results in this study have provided evidence that equal variance does not exist in Levels of Care data, and thus even more doubts about the probability statements are raised. The remaining conditions, related to the data-producing sample which has provided these responses, can be explained by the power-efficiency of the non-parametric statistical techniques.[2]

The ordinal tests have P-e of from 95 to 96 percent, and with our sample size being relatively large this provides for the power-efficiency of results from ordinal tests, yet probability statements are more reliable in that all the parametric conditions are <u>not</u> met.[3] The investigator would re-emphasize for example, that the assumption of homoscedas-

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[1]Siegel, p. 20.

[2]*Ibid.*, p. 22.

[3]An example to clarify this point about the meaning of probability statements as related to the measurement and specific purpose of each test can be illustrated as follows:

SEX	LEVELS OF CARE DISTRIBUTIONS I ONE	II TWO	III THREE	TOTAL	LEVEL
MALES	20	60	20	100	$\bar{X}$ = 2.00 (II)
FEMALES	40	20	40	100	$\bar{X}$ = 2.00 (II)

In the above example, the T-test would not be significant, yet the χ^2 would; the converse would not be true when if χ^2 is not significant the T-test would also be not significant.

ticity (equal variance) when tested was not met, and thus in no one instance was the variance equal. Although our responses to the null hypotheses did not differ, the explanation for these similarities more likely lie in the violation of the parametric statistical model, and in the higher power of the non-parametric tests employed.

The investigator's second conclusion pertains to the central purpose of the study, that of evolving a method of statistical analysis for the treatment of Levels of Care data which would be of value to nursing practice and to the administration of nursing units. Our findings clearly indicate that the non-parametric statistical tests provide the optimum amound and kind of information, as well as the most valid responses to probability statements of rejecting H_0 when it is false.

In order to use statistical analytical techniques on a continual basis or for large amounts of data the investigator concludes that the use of a computer data-processing center is essential. It would seem to be most evident from the findings of this study that the selected variables employed here do make appreciable differences in nursing care requirements, as they indicate differences in assignment to Levels of Care. In so far as this is accepted as important, the use of statistical analysis on the basis of these variables would be indicated at varying periods of time and would be dependent upon the ultimate use of the findings, such as for utilization patterns or staffing patterns, and/or educa-

tional requirements. The economic and practical problems would be of importance in that once the use of the ordinal tests proven in the study to be the best method for analysis of Levels of Care data have been decided upon, the questions of how much information and how often the information is required, as well as the expense arise. Such problems are not insurmountable, but are factors which involve the individual institution. In order to be of practical use to the practice of nursing in evolving a patient mix vis-a-vis a resource mix not only the individual institution, but the specific nursing department must judge how this information will assist them in determining their own patterns.

The criteria on which we conclude that the ordinal statistical tests cited here comprise a "valid method of statistical analysis" are: appropriateness, in the statistical sense, sensitivity to what is being measured, and objectivity in the data-collection method. Also it must be a method which affords a practical and economic way of processing and using the data to meet the needs of the institution. Our remaining conclusion stems from the results of the statistical tests related to the Elements (A, B, and C) of direct nursing care. The investigator views the Elements as an important consideration in both a practical and a statistical sense, and is therefore germane to any anticipated applications of Levels of Care findings such as the staffing of nursing units and the provision of future health care facilities.

The final analysis of the elements of direct nursing

care (i.e. the analysis of those factors which are used to derive the Levels), clearly shows that the "Levels" are but crude indicators; thus, the potential of this classification method as an accurate indicator of the patient requirements is, in the investigator's considered opinion, imprecise. The findings from the study clearly point to the need to evaluate the ranges in A, B, and C scores for each Level and the importance of applying non-parametric statistical tests to these scores as well as to the Levels of Care data in order to provide a "better," albeit still crude, indicator of direct nursing care requirements.

These then, are the central conclusions. We shall now turn to the recommendations growing out of this study.

RECOMMENDATIONS

The two central recommendations arising from this study encompass the use of: (1) statistical analytical techniques for Levels of Care data and the applications of these techniques to the provision of patient care; and (2) future research related to selected variables in the study of Levels of Care data.

The appropriateness of the use of ordinal tests for statistical analysis of Levels of Care data has been demonstrated in this study. The SCAN system (Scheduled Activities of Nursing) uses data processed printouts of a patient's basic care needs, which facilitate decisions about the provision of nursing care. and communication regarding the pa-

tient's nursing care requirements on a daily basis from the time of admission. Day-to-day changes are made by sending computer cards to delete or add items which are then incorporated into the following day's SCAN.[1] This system not only evaluates the care requirement but allows for the assignment of personnel. In recommending use of statistical analysis for Levels of Care data, and continual gathering of such data, it is necessary to consider ways and means of reducing the paper work and maximizing the use of automated data processing and statistical testing. Regardless of whether or not the information gathered is to be of use in the provision of nursing care, e.g., Individual Nursing Unit, and/or in assessing the use of and/or requirements of specific facilities and resources, e.g., in a Community or Province, the investigator considers automated facilities for data processing as being essential. The use of data processing services available to government departments, university computer centers and those in use by banks, seems a reasonable possibility. The use of such services by several institutions or regions would allow for the otherwise exorbitant cost to fall within economic constraints.

The areas for use of analysis of Levels of Care data, by using ordinal statistical techniques, on the basis of the variables which influence the assignment amongst the Levels,

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[1]Eunice L. Speed, and Nancy A. Young, "SCAN Data Processed Printouts of a Patient's Basic Care Needs," A.J.N. 69 (January, 1969), pp. 108-110.

are specifically related to staffing and utilization studies. The Levels of Care approach arose out of the need for a more sensitive instrument or method to evaluate the variations in demand for care in order to better evolve methods for provision of resources to supply care. In so far as the Levels of Care approach is superior to that of sheer patient census or occupancy rates, the results of this study verify the fact that it is still a "crude indicator." The instrument used for this study, however, permits more precise analysis by use of the Elements of direct nursing care within each of the respective levels, e.g., through factor and item analyses.

In that the direct cost concept[1] provides for flexibility related to levels of activity, and it justifies variances by differences in occupancy rate, the Levels of Care approach could conceivably be used in its application to staffing nursing floors. Price, it will be recalled, advised from evidence collected in her study that "classification of patients for adjustments of nursing hours be discontinued unless results can be improved."[2] Our findings imply that more precise application of Levels of Care information would be useful in improving the assignment of staff and would also allow for improvements in the health care delivery system.

Further research is required, primarily in developing

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[1]L. F. Patterson, "Direct Cost Concept: How it Applies to Budgeting; Staffing Nursing Floors," Hospital Administration in Canada (August, 1969), p. 55.

[2]Price, p. 56.

more precise analysis by Elements of direct nursing care using the selected variables employed in this study. As well, analysis using other variables related to patient and institutional characteristics such as ethnic groups, types of medical staff, changing technology, and patterns of medical practice. The need of continue research in relating "Levels of Care" data to "workload and productivity" indices developed by work measurement and timing studies is seen as important, along with attempts to develop less cumbersome and inflexible methods for analysing such relationships, i.e. methods which could be more easily adapted to each unique situation. Further research concerned with correlating individual Levels of Care and the Elements would probably develop a more precise way of describing the distribution among the Levels and provide the nursing unit with a still better and more sensitive instrument for the delicate variable "the patient."

Acceptance of responsibility for the development of continuing research by health service administrators requires that substantial effort be made to describe more fully "the behavioral and economic parameters of patient care and health system models."[1] This study has provided descriptions of some of the parameters of patient care requirements.

The use of the information provided by this type of statistical analysis in relation to the concept of "progres-

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[1]Wanda MacDowell, "Conference on Cost Effectiveness and Patient Care," Nurs. Res. Rep. 2:1, (March, 1967), p. 2.

sive patient care," may very well provide useful information required in the assessment of the utilization of health care facilities.

"Good care is not just bedside care. . . . No single individual or group can give it. It is a combined effort."[1] It is evident that the data collected and analysed for this study portrays but a small part of the nursing requirements of hospitalized patients. It will be in a combined effort that the ultimate improvement of patient care will be achieved.

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[1]Kenneth Babuck, "Yesterday-today-tomorrow," Hospital Progress 46:6 (June, 1965), p. 96.

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THE APPENDICES

The appendices are sequenced in such a way as to facilitate relating the statistical techniques used by the independent variables in the research hypotheses, and the data-producing sample, by data collection periods. The tables are reduced-size replications of the computer print-outs. Illustrations of each type of table are provided in Chapter III[1] in order to facilitate their interpretation.

The appendices are ordered alphabetically from A to E, with a title page before each set. The variables of sex, type of ward, specific ward, nursing students, nursing students controlling for ward type 1 = medical, 2 = surgical, accommodation, age, and marital status will be in this same sequence, whenever the statistical test is applicable. Appendix A consists of the nominal statistical tests, by variables, and by data collection period, in the order of first, second, third, and total data-producing sample. Appendix B is comprised of the ordinal statistical tests, by variables and data collection periods, in the same order as applicable. Appendix C includes the interval statistical tests in the same arrangement as the two prior appendices. In Appendix D the order is somewhat varied in that it contains the nominal tests for the total data-producing sample, by sample (data collection periods) and the ANOVA-F TEST by sample. Also included in this appendix are the nominal tests, for the multivariable divisions, the categorical breakdowns

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[1]See "Guide to the Tables" pp. 91 to 112.

by marital status, sex, and age, by the total data-producing sample only. The sequence includes sex controlling for marital status, marital status controlling for sex, sex controlling for marital status by age, age controlling for marital status by sex, and marital status controlling for sex by age. Appendix E contains all the statistical tests performed for the elements of direct nursing care, A, B, and C, by Levels of Care. The title pages will specify the tests, and data collection periods for each Appendix.

APPENDIX A

Nominal Tests

Chi Square

Data Collection Periods

First

Second

Third

Total Data-Producing Sample

Tables 1 to 53

TABLE 1

FILE FIRST (CREATION DATE = 01/10/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
SEX SEX BY LEVEL LEVEL OF CARE
* *

SEX	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MALE	1.00	21 15.7 95.5 7.9	93 69.4 49.7 34.8	20 14.9 34.5 7.5	134 50.2
FEMALE	2.00	1 0.8 4.5 0.4	94 70.7 50.3 35.2	38 28.6 65.5 14.2	133 49.8
	COLUMN TOTAL	22 8.2	187 70.0	58 21.7	267 100.0

CHI SQUARE = 23.76994 WITH 2 DEGREES OF FREEDOM

TABLE 2

FILE FIRST (CREATION DATE = 01/10/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
WDTYPE TYPE OF WARD BY LEVEL LEVEL OF CARE
* *

WDTYPE	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MEDICAL	1.00	12 9.2 54.5 4.5	99 75.6 52.9 37.1	20 15.3 34.5 7.5	131 49.1
SURGICAL	2.00	10 7.4 45.5 3.7	88 64.7 47.1 33.0	38 27.9 65.5 14.2	136 50.9
	COLUMN TOTAL	22 8.2	187 70.0	58 21.7	267 100.0

CHI SQUARE = 6.32367 WITH 2 DEGREES OF FREEDOM

TABLE 3

FILE FIRST (CREATION DATE = 01/10/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE
* *

WARD	LEVEL COUNT ROW PCT COL PCT TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
5E MEDICAL	5.00	0	25	5	30
		0.0	83.3	16.7	22.9
		0.0	25.3	25.0	
		0.0	19.1	3.8	
5W MEDICAL	6.00	0	24	6	30
		0.0	80.0	20.0	22.9
		0.0	24.2	30.0	
		0.0	18.3	4.6	
6E MEDICAL	7.00	9	20	7	36
		25.0	55.6	19.4	27.5
		75.0	20.2	35.0	
		6.9	15.3	5.3	
6W MEDICAL	8.00	3	30	2	35
		8.6	85.7	5.7	26.7
		25.0	30.3	10.0	
		2.3	22.9	1.5	
	COLUMN TOTAL	12	99	20	131
		9.2	75.6	15.3	100.0

CHI SQUARE = 21.05373 WITH 6 DEGREES OF FREEDOM

TABLE 4

FILE FIRST (CREATION DATE = 01/10/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE

* *

WARD	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
3E SURGICAL	1.00	0 0.0 0.0 0.0	22 64.7 25.0 16.2	12 35.3 31.6 8.8	34 25.0
3W SURGICAL	2.00	1 3.0 10.0 0.7	17 51.5 19.3 12.5	15 45.5 39.5 11.0	33 24.3
4E SURGICAL	3.00	6 18.8 60.0 4.4	21 65.6 23.9 15.4	5 15.6 13.2 3.7	32 23.5
4W SURGICAL	4.00	3 8.1 30.0 2.2	28 75.7 31.8 20.6	6 16.2 15.8 4.4	37 27.2
	COLUMN TOTAL	10 7.4	88 64.7	38 27.9	136 100.0

CHI SQUARE = 18.43796 WITH 6 DEGREES OF FREEDOM

TABLE 5

FILE FIRST (CREATION DATE = 01/10/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
NSTUDENT NURSING STUDENTS? BY LEVEL LEVEL OF CARE
* *

NSTUDENT	LEVEL COUNT ROW PCT COL PCT TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
NO	0.0	18 10.8 81.8 6.7	118 70.7 63.1 44.2	31 18.6 53.4 11.6	167 62.5
YES	1.00	4 4.0 18.2 1.5	69 69.0 36.9 25.8	27 27.0 46.6 10.1	100 37.5
	COLUMN TOTAL	22 8.2	187 70.0	58 21.7	267 100.0

CHI SQUARE = 5.56202 WITH 2 DEGREES OF FREEDOM

TABLE 6

FILE FIRST (CREATION DATE = 01/20/71)

* * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *

NSTUDENT NURSING STUDENTS? BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

HDTYPE TYPE OF WARD VALUE = 1.00 MEDICAL

* *

	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
NSTUDENT NO	0.0	12	75	14	101
		11.9	74.3	13.9	77.1
		100.0	75.8	70.0	
		9.2	57.3	10.7	
YES	1.00	0	24	6	30
		0.0	80.0	20.0	22.9
		0.0	24.2	30.0	
		0.0	18.3	4.6	
	COLUMN TOTAL	12	99	20	131
		9.2	75.6	15.3	100.0

CHI SQUARE = 4.[illegible]3617 WITH 2 DEGREES OF FREEDOM

TABLE 7

FILE FIRST (CREATION DATE = 01/20/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
NSTUDENT NURSING STUDENTS? BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
NDTYPE TYPE OF WARD VALUE = 2.00 SURGICAL
* *

NSTUDENT	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
NO	0.0	6	43	17	66
		9.1	65.2	25.8	48.5
		60.0	48.9	44.7	
		4.4	31.6	12.5	
YES	1.00	4	45	21	70
		5.7	64.3	30.0	51.5
		40.0	51.1	55.3	
		2.9	33.1	15.4	
	COLUMN TOTAL	10	88	38	136
		7.4	64.7	27.9	100.0

CHI SQUARE = 0.74951 WITH 2 DEGREES OF FREEDOM

TABLE 8

FILE FIRST (CREATION DATE = 01/20/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
NSTUDENT NURSING STUDENTS? VALUE = 0.0 NO
* *

WARD	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
5E MEDICAL	5.00	0	25	5	30
		0.0	83.3	16.7	29.7
		0.0	33.3	35.7	
		0.0	24.8	5.0	
6E MEDICAL	7.00	9	20	7	36
		25.0	55.6	19.4	35.6
		75.0	26.7	50.0	
		8.9	19.8	6.9	
6W MEDICAL	8.00	3	30	2	35
		8.6	85.7	5.7	34.7
		25.0	40.0	14.3	
		3.0	29.7	2.0	
	COLUMN TOTAL	12	75	14	101
		11.9	74.3	13.9	100.0

CHI SQUARE = 14.40471 WITH 4 DEGREES OF FREEDOM

TABLE 9

FILE FIRST (CREATION DATE = 01/20/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE

CONTROLLING FOR..
NSTUDENT NURSING STUDENTS? VALUE = 0.0 NO

WARD	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: II ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
3E SURGICAL	1.00	0	22	12	34
		0.0	64.7	35.3	51.5
		0.0	51.2	70.6	
		0.0	33.3	18.2	
4E SURGICAL	3.00	6	21	5	32
		18.8	65.6	15.6	48.5
		100.0	48.8	29.4	
		9.1	31.8	7.6	
COLUMN TOTAL		6	43	17	66
		9.1	65.2	25.8	100.0

CHI SQUARE = 8.85313 WITH 2 DEGREES OF FREEDOM

TABLE 10

```
FILE   FIRST     (CREATION DATE = 01/20/71)

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * *
   WARD      SPECIFIC WARD                                    BY  LEVEL     LEVEL OF CARE
CONTROLLING FOR..
   NSTUDENT  NURSING STUDENTS?                                VALUE =       1.00  YES
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                  LEVEL
            COUNT  I
          ROW PCT  III TWO   III THRE   ROW
          COL PCT  I         E          TOTAL
          TOT PCT  I    2.00I    3.00I
WARD      --------I--------I--------I
             6.00  I    24  I     6  I    30
  5W MEDICAL       I  80.0  I  20.0  I 100.0
                   I 100.0  I 100.0  I
                   I  80.0  I  20.0  I
                  -I--------I--------I
           COLUMN       24        6       30
            TOTAL     80.0     20.0    100.0
```

TABLE 11

FILE FIRST (CREATION DATE = 01/20/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
NSTUDENT NURSING STUDENTS? VALUE = 1.00 YES
* *

WARD	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
3W SURGICAL	2.00	1	17	15	33
		3.0	51.5	45.5	47.1
		25.0	37.8	71.4	
		1.4	24.3	21.4	
4W SURGICAL	4.00	3	28	6	37
		8.1	75.7	16.2	52.9
		75.0	62.2	28.6	
		4.3	40.0	8.6	
COLUMN TOTAL		4	45	21	70
		5.7	64.3	30.0	100.0

CHI SQUARE = 7.34143 WITH 2 DEGREES OF FREEDOM

TABLE 12

FILE PIRST (CREATION DATE = 01/10/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
ACCOM ACCOMODATION BY LEVEL LEVEL OF CARE
* *

ACCOM	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
PRIVATE	1.00	4	42	11	57
		7.0	73.7	19.3	21.3
		18.2	22.5	19.0	
		1.5	15.7	4.1	
SEMI-PRIVATE	2.00	6	59	21	86
		7.0	68.6	24.4	32.2
		27.3	31.6	36.2	
		2.2	22.1	7.9	
WARD	3.00	12	86	26	124
		9.7	69.4	21.0	46.4
		54.5	46.0	44.8	
		4.5	32.2	9.7	
	COLUMN TOTAL	22	187	58	267
		8.2	70.0	21.7	100.0

CHI SQUARE = 1.19707 WITH 4 DEGREES OF FREEDOM

TABLE 13

FILE FIRST (CREATION DATE = 01/10/71)

CROSSTABULATION OF AGE AGE BY LEVEL LEVEL OF CARE

AGE	COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
1.00 UNDER 20 YEARS		0 0.0 0.0 0.0	5 71.4 2.7 1.9	2 28.6 3.4 0.7	7 2.6
2.00 21-35 YEARS		5 9.8 22.7 1.9	37 72.5 19.8 13.9	9 17.6 15.5 3.4	51 19.1
3.00 36-50 YEARS		8 13.8 36.4 3.0	39 67.2 20.9 14.6	11 19.0 19.0 4.1	58 21.7
4.00 51-65 YEARS		3 4.4 13.6 1.1	46 67.6 24.6 17.2	19 27.9 32.8 7.1	68 25.5
5.00 66-80 YEARS		4 6.8 18.2 1.5	45 76.3 24.1 16.9	10 16.9 17.2 3.7	59 22.1
6.00 OVER 80 YEARS		2 8.3 9.1 0.7	15 62.5 8.0 5.6	7 29.2 12.1 2.6	24 9.0
COLUMN TOTAL		22 8.2	187 70.0	58 21.7	267 100.0

CHI SQUARE = 8.13710 WITH 10 DEGREES OF FREEDOM

TABLE 14

FILE FIRST (CREATION DATE = 01/10/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
MARITAL MARITAL STATUS BY LEVEL LEVEL OF CARE
* *

MARITAL	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MARRIED	1.00	18 9.8 81.8 6.7	128 69.6 68.4 47.9	38 20.7 65.5 14.2	184 68.9
SINGLE	2.00	3 10.3 13.6 1.1	22 75.9 11.8 8.2	4 13.8 6.9 1.5	29 10.9
WIDOWED	3.00	0 0.0 0.0 0.0	24 64.9 12.8 9.0	13 35.1 22.4 4.9	37 13.9
DIVORCED	4.00	1 14.3 4.5 0.4	6 85.7 3.2 2.2	0 0.0 0.0 0.0	7 2.6
SEPARATED	5.00	0 0.0 0.0 0.0	6 66.7 3.2 2.2	3 33.3 5.2 1.1	9 3.4
OTHER	6.00	0 0.0 0.0 0.0	1 100.0 0.5 0.4	0 0.0 0.0 0.0	1 0.4
	COLUMN TOTAL	22 8.2	187 70.0	58 21.7	267 100.0

CHI SQUARE = 11.84377 WITH 10 DEGREES OF FREEDOM

TABLE 15

FILE SECOND (CREATION DATE = 02/05/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
SEX SEX BY LEVEL LEVEL-OF-CARE

SEX	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MALE	1.00	20 16.3 58.8 7.7	90 73.2 46.2 34.6	13 10.6 41.9 5.0	123 47.3
FEMALE	2.00	14 10.2 41.2 5.4	105 76.6 53.8 40.4	18 13.1 58.1 6.9	137 52.7
	COLUMN TOTAL	34 13.1	195 75.0	31 11.9	260 100.0

CHI SQUARE = 2.27186 WITH 2 DEGREES OF FREEDOM

TABLE 16

FILE SECOND (CREATION DATE = 02/05/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
WDTYPE TYPE OF WARD BY LEVEL LEVEL OF CARE
* *

WDTYPE	LEVEL COUNT I ROW PCT I COL PCT TOT PCT	I ONE 1.00	II TWO 2.00	III THRE E 3.00	ROW TOTAL
MEDICAL	1.00	14 11.0 41.2 5.4	108 85.0 55.4 41.5	5 3.9 16.1 1.9	127 48.8
SURGICAL	2.00	20 15.0 58.8 7.7	87 65.4 44.6 33.5	26 19.5 83.9 10.0	133 51.2
	COLUMN TOTAL	34 13.1	195 75.0	31 11.9	260 100.0

CHI SQUARE = 17.41698 WITH 2 DEGREES OF FREEDOM

TABLE 17

FILE SECOND (CREATION DATE = 02/05/71)

* * * * * * * * * * * * * * * * * * CROSSTABULATION OF * * * * *
WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE

WARD	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
5E MEDICAL	5.00	2 6.9 14.3 1.6	25 86.2 23.1 19.7	2 6.9 40.0 1.6	29 22.8
5W MEDICAL	6.00	3 9.7 21.4 2.4	28 90.3 25.9 22.0	0 0.0 0.0 0.0	31 24.4
6E MEDICAL	7.00	5 14.3 35.7 3.9	29 82.9 26.9 22.8	1 2.9 20.0 0.8	35 27.6
6W MEDICAL	8.00	4 12.5 28.6 3.1	26 81.3 24.1 20.5	2 6.3 40.0 1.6	32 25.2
COLUMN TOTAL		14 11.0	108 85.0	5 3.9	127 100.0

CHI SQUARE = 3.48437 WITH 6 DEGREES OF FREEDOM

TABLE 18

FILE SECOND (CREATION DATE = 02/05/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE
* *

WARD	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
3E SURGICAL	1.00	6	24	3	33
		18.2	72.7	9.1	24.8
		30.0	27.6	11.5	
		4.5	18.0	2.3	
3W SURGICAL	2.00	2	19	13	34
		5.9	55.9	38.2	25.6
		10.0	21.8	50.0	
		1.5	14.3	9.8	
4E SURGICAL	3.00	6	24	3	33
		18.2	72.7	9.1	24.8
		30.0	27.6	11.5	
		4.5	18.0	2.3	
4W SURGICAL	4.00	6	20	7	33
		18.2	60.6	21.2	24.8
		30.0	23.0	26.9	
		4.5	15.0	5.3	
COLUMN TOTAL		20	87	26	133
		15.0	65.4	19.5	100.0

CHI SQUARE = 13.48671 WITH 6 DEGREES OF FREEDOM

TABLE 19

FILE SECOND (CREATION DATE = 02/05/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
NSTUDENT NURSING STUDENTS? BY LEVEL LEVEL OF CARE
* *

NSTUDENT	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
NO	0.0	4 12.5 11.8 1.5	26 81.3 13.3 10.0	2 6.3 6.5 0.8	32 12.3
YES	1.00	30 13.2 88.2 11.5	169 74.1 86.7 65.0	29 12.7 93.5 11.2	228 87.7
	COLUMN TOTAL	34 13.1	195 75.0	31 11.9	260 100.0

CHI SQUARE = 1.18435 WITH 2 DEGREES OF FREEDOM

TABLE 20

FILE SECOND (CREATION DATE = 02/05/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
NSTUDENT NURSING STUDENTS? BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
NOTYPE TYPE OF WARD VALUE = 1.00 MEDICAL
* *

NSTUDENT	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
NO	0.0	4 12.5 28.6 3.1	26 81.3 24.1 20.5	2 6.3 40.0 1.6	32 26.2
YES	1.00	10 10.5 71.4 7.9	82 86.3 75.9 64.6	3 3.2 60.0 2.4	95 74.8
	COLUMN TOTAL	14 11.0	108 85.0	5 3.9	127 100.0

CHI SQUARE = 0.73814 WITH 2 DEGREES OF FREEDOM

TABLE 21

FILE SECOND (CREATION DATE = 02/05/71)

* * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *

NSTUDENT NURSING STUDENTS? BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

WDTYPE TYPE OF WARD VALUE = 2.00 SURGICAL

* *

NSTUDENT	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
YES	1.00	20 15.0 100.0 15.0	87 65.4 100.0 65.4	26 19.5 100.0 19.5	133 100.0
	COLUMN TOTAL	20 15.0	87 65.4	26 19.5	133 100.0

TABLE 22

FILE SECOND (CREATION DATE = 02/05/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
NSTUDENT NURSING STUDENTS? VALUE = 0.0 NO
* *

WARD	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
6W MEDICAL	8.00	4	26	2	32
		12.5	81.3	6.3	100.0
		100.0	100.0	100.0	
		12.5	81.3	6.3	
	COLUMN TOTAL	4	26	2	32
		12.5	81.3	6.3	100.0

TABLE 23

FILE SECOND (CREATION DATE = 02/05/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
NSTUDENT NURSING STUDENTS? VALUE = 1.00 YES
* *

WARD	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
5E MEDICAL	5.00	2	25	2	29
		6.9	86.2	6.9	30.5
		20.0	30.5	66.7	
		2.1	26.3	2.1	
5W MEDICAL	6.00	3	28	0	31
		9.7	90.3	0.0	32.6
		30.0	34.1	0.0	
		3.2	29.5	0.0	
6E MEDICAL	7.00	5	29	1	35
		14.3	82.9	2.9	36.8
		50.0	35.4	33.3	
		5.3	30.5	1.1	
	COLUMN TOTAL	10	82	3	95
		10.5	86.3	3.2	100.0

CHI SQUARE = 3.23290 WITH 4 DEGREES OF FREEDOM

TABLE 24

FILE SECOND (CREATION DATE = 02/05/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
NSTUDENT NURSING STUDENTS? VALUE = 1.00 YES
* *

WARD	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
3E SURGICAL	1.00	6	24	3	33
		18.2	72.7	9.1	24.8
		30.0	27.6	11.5	
		4.5	18.0	2.3	
3W SURGICAL	2.00	2	19	13	34
		5.9	55.9	38.2	25.6
		10.0	21.8	50.0	
		1.5	14.3	9.8	
4E SURGICAL	3.00	6	24	3	33
		18.2	72.7	9.1	24.8
		30.0	27.6	11.5	
		4.5	18.0	2.3	
4W SURGICAL	4.00	6	20	7	33
		18.2	60.6	21.2	24.8
		30.0	23.0	26.9	
		4.5	15.0	5.3	
	COLUMN TOTAL	20	87	26	133
		15.0	65.4	19.5	100.0

CHI SQUARE = 13.48671 WITH 6 DEGREES OF FREEDOM

TABLE 25

FILE SECOND (CREATION DATE = 02/05/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
ACCOM ACCOMODATION BY LEVEL LEVEL OF CARE
* *

ACCOM	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
PRIVATE	1.00	6 11.8 17.6 2.3	38 74.5 19.5 14.6	7 13.7 22.6 2.7	51 19.6
SEMI-PRIVATE	2.00	9 11.0 26.5 3.5	62 75.6 31.8 23.8	11 13.4 35.5 4.2	82 31.5
WARD	3.00	19 15.0 55.9 7.3	95 74.8 48.7 36.5	13 10.2 41.9 5.0	127 48.8
	COLUMN TOTAL	34 13.1	195 75.0	31 11.9	260 100.0

CHI SQUARE = 1.29005 WITH 4 DEGREES OF FREEDOM

TABLE 26

FILE SECOND (CREATION DATE = 02/05/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
AGE AGE BY LEVEL LEVEL OF CARE
* *

AGE	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
UNDER 20 YEARS	1.00	1 10.0 2.9 0.4	8 80.0 4.1 3.1	1 10.0 3.2 0.4	10 3.8
21-35 YEARS	2.00	4 11.1 11.8 1.5	30 83.3 15.4 11.5	2 5.6 6.5 0.8	36 13.8
36-50 YEARS	3.00	17 23.0 50.0 6.5	51 68.9 26.2 19.6	6 8.1 19.4 2.3	74 28.5
51-65 YEARS	4.00	4 5.3 11.8 1.5	60 80.0 30.8 23.1	11 14.7 35.5 4.2	75 28.8
66-80 YEARS	5.00	6 16.7 17.6 2.3	24 66.7 12.3 9.2	6 16.7 19.4 2.3	36 13.8
OVER 80 YEARS	6.00	2 6.9 5.9 0.8	22 75.9 11.3 8.5	5 17.2 16.1 1.9	29 11.2
COLUMN TOTAL		34 13.1	195 75.0	31 11.9	260 100.0

CHI SQUARE = 16.67854 WITH 10 DEGREES OF FREEDOM

TABLE 27

FILE SECOND (CREATION DATE = 02/05/71)

* * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
MARITAL MARITAL STATUS BY LEVEL LEVEL OF CARE
* *

MARITAL	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MARRIED	1.00	25 14.9 73.5 9.6	120 71.4 61.5 46.2	23 13.7 74.2 8.8	168 64.6
SINGLE	2.00	3 9.1 8.8 1.2	29 87.9 14.9 11.2	1 3.0 3.2 0.4	33 12.7
WIDOWED	3.00	2 5.1 5.9 0.8	32 82.1 16.4 12.3	5 12.8 16.1 1.9	39 15.0
DIVORCED	4.00	0 0.0 0.0 0.0	8 80.0 4.1 3.1	2 20.0 6.5 0.8	10 3.8
SEPARATED	5.00	4 44.4 11.8 1.5	5 55.6 2.6 1.9	0 0.0 0.0 0.0	9 3.5
OTHER	6.00	0 0.0 0.0 0.0	1 100.0 0.5 0.4	0 0.0 0.0 0.0	1 0.4
	COLUMN TOTAL	34 13.1	195 75.0	31 11.9	260 100.0

CHI SQUARE = 17.15263 WITH 10 DEGREES OF FREEDOM

TABLE 28

```
FILE   THIRD    (CREATION DATE = 02/27/71)

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * *
   SEX        SEX                                                  BY  LEVEL     LEVEL OF CARE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                     LEVEL
             COUNT  I
           ROW PCT  II ONE     II TWO    III THRE    ROW
           COL PCT  I                    E           TOTAL
           TOT PCT  I     1.00I     2.00I     3.00I
SEX        --------I--------I--------I--------I
             1.00   I    23  I    93  I    13  I   129
  MALE              I  17.8  I  72.1  I  10.1  I  48.9
                    I  63.9  I  46.3  I  48.1  I
                    I   8.7  I  35.2  I   4.9  I
                   -I--------I--------I--------I
             2.00   I    13  I   108  I    14  I   135
  FEMALE            I   9.6  I  80.0  I  10.4  I  51.1
                    I  36.1  I  53.7  I  51.9  I
                    I   4.9  I  40.9  I   5.3  I
                   -I--------I--------I--------I
           COLUMN        36      201       27      264
            TOTAL      13.6     76.1     10.2    100.0

CHI SQUARE =     3.79982 WITH   2 DEGREES OF FREEDOM
```

TABLE 29

FILE THIRD (CREATION DATE = 02/27/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
WDTYPE TYPE OF WARD BY LEVEL LEVEL OF CARE
* *

WDTYPE	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	ONE 1.00	TWO 2.00	THREE 3.00	ROW TOTAL
MEDICAL	1.00	22	105	4	131
		16.8	80.2	3.1	49.6
		61.1	52.2	14.8	
		8.3	39.8	1.5	
SURGICAL	2.00	14	96	23	133
		10.5	72.2	17.3	50.4
		38.9	47.8	85.2	
		5.3	36.4	8.7	
	COLUMN TOTAL	36	201	27	264
		13.6	76.1	10.2	100.0

CHI SQUARE = 15.53687 WITH 2 DEGREES OF FREEDOM

TABLE 30

FILE THIRD (CREATION DATE = 02/27/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE

WARD	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
5E MEDICAL	5.00	4	27	1	32
		12.5	84.4	3.1	24.4
		18.2	25.7	25.0	
		3.1	20.6	0.8	
5W MEDICAL	6.00	3	27	1	31
		9.7	87.1	3.2	23.7
		13.6	25.7	25.0	
		2.3	20.6	0.8	
6E MEDICAL	7.00	11	20	2	33
		33.3	60.6	6.1	25.2
		50.0	19.0	50.0	
		8.4	15.3	1.5	
6W MEDICAL	8.00	4	31	0	35
		11.4	88.6	0.0	26.7
		18.2	29.5	0.0	
		3.1	23.7	0.0	
	COLUMN TOTAL	22	105	4	131
		16.8	80.2	3.1	100.0

CHI SQUARE = 11.45121 WITH 6 DEGREES OF FREEDOM

TABLE 31

FILE THIRD (CREATION DATE = 02/27/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE

WARD	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
3E SURGICAL	1.00	2	28	3	33
		6.1	84.8	9.1	24.8
		14.3	29.2	13.0	
		1.5	21.1	2.3	
3W SURGICAL	2.00	1	21	9	31
		3.2	67.7	29.0	23.3
		7.1	21.9	39.1	
		0.8	15.8	6.8	
4E SURGICAL	3.00	5	22	6	33
		15.2	66.7	18.2	24.8
		35.7	22.9	26.1	
		3.8	16.5	4.5	
4W SURGICAL	4.00	6	25	5	36
		16.7	69.4	13.9	27.1
		42.9	26.0	21.7	
		4.5	18.8	3.8	
	COLUMN TOTAL	14	96	23	133
		10.5	72.2	17.3	100.0

CHI SQUARE = 9.16003 WITH 6 DEGREES OF FREEDOM

TABLE 32

FILE THIRD (CREATION DATE = 02/27/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
NSTUDENT NURSING STUDENTS? BY LEVEL LEVEL OF CARE
* *

	LEVEL				
	COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
NSTUDENT 1.00 YES		36 13.6 100.0 13.6	201 76.1 100.0 76.1	27 10.2 100.0 10.2	264 100.0
	COLUMN TOTAL	36 13.6	201 76.1	27 10.2	264 100.0

TABLE 33

```
FILE    THIRD     (CREATION DATE = 02/27/71)

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * *
    NSTUDENT  NURSING STUDENTS?                                  BY  LEVEL     LEVEL OF CARE
CONTROLLING FOR..
    WDTYPE     TYPE OF WARD                                      VALUE =        1.00  MEDICAL
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                    LEVEL
            COUNT   I
            ROW PCT II ONE      II TWO    III THRE    ROW
            COL PCT I                         E       TOTAL
            TOT PCT I     1.00I     2.00I     3.00I
NSTUDENT    --------I---------I---------I---------I
              1.00  I      22 I     105 I       4 I    131
  YES               I    16.8 I    80.2 I     3.1 I  100.0
                    I   100.0 I   100.0 I   100.0 I
                    I    16.8 I    80.2 I     3.1 I
                   -I---------I---------I---------I
            COLUMN         22       105         4      131
             TOTAL       16.8      80.2       3.1    100.0
```

TABLE 34

```
FILE   THIRD    (CREATION DATE = 02/27/71)

* * * * * * * * * * * * * * * * * *  C R O S S T A B U L A T I O N   O F   * * * * * *
    NSTUDENT  NURSING STUDENTS?                                   BY  LEVEL     LEVEL OF CARE
CONTROLLING FOR..
    WDTYPE    TYPE OF WARD                                        VALUE =       2.00  SURGICAL
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                      LEVEL
            COUNT  I
          ROW PCT II ONE     II TWO    III THRE    ROW
          COL PCT I                    E          TOTAL
          TOT PCT I     1.00I     2.00I     3.00I
NSTUDENT  --------I---------I---------I---------I
             1.00 I      14 I      96 I      23 I    133
  YES             I    10.5 I    72.2 I    17.3 I  100.0
                  I   100.0 I   100.0 I   100.0 I
                  I    10.5 I    72.2 I    17.3 I
                 -I---------I---------I---------I
           COLUMN       14        96        23       133
            TOTAL     10.5      72.2      17.3     100.0
```

TABLE 35

FILE THIRD (CREATION DATE = 02/27/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
NSTUDENT NURSING STUDENTS? VALUE = 1.00 YES

WARD	LEVEL COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
SE MEDICAL	5.00	4	27	1	32
		12.5	84.4	3.1	24.4
		18.2	25.7	25.0	
		3.1	20.6	0.8	
SW MEDICAL	6.00	3	27	1	31
		9.7	87.1	3.2	23.7
		13.6	25.7	25.0	
		2.3	20.6	0.8	
6E MEDICAL	7.00	11	20	2	33
		33.3	60.6	6.1	25.2
		50.0	19.0	50.0	
		8.4	15.3	1.5	
6W MEDICAL	8.00	4	31	0	35
		11.4	88.6	0.0	26.7
		18.2	29.5	0.0	
		3.1	23.7	0.0	
	COLUMN TOTAL	22	105	4	131
		16.8	80.2	3.1	100.0

CHI SQUARE = 11.45121 WITH 6 DEGREES OF FREEDOM

TABLE 36

FILE THIRD (CREATION DATE = 02/27/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * *

WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

NSTUDENT NURSING STUDENTS? VALUE = 1.00 YES

* *

WARD	LEVEL COUNT ROW PCT COL PCT TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
3E SURGICAL	1.00	2 6.1 14.3 1.5	28 84.8 29.2 21.1	3 9.1 13.0 2.3	33 24.8
3W SURGICAL	2.00	1 3.2 7.1 0.8	21 67.7 21.9 15.8	9 29.0 39.1 6.8	31 23.3
4E SURGICAL	3.00	5 15.2 35.7 3.8	22 66.7 22.9 16.5	6 18.2 26.1 4.5	33 24.8
4W SURGICAL	4.00	6 16.7 42.9 4.5	25 69.4 26.0 18.8	5 13.9 21.7 3.8	36 27.1
COLUMN TOTAL		14 10.5	96 72.2	23 17.3	133 100.0

CHI SQUARE = 9.16003 WITH 6 DEGREES OF FREEDOM

TABLE 37

FILE THIRD (CREATION DATE = 02/27/71)

* * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
ACCOM ACCOMODATION BY LEVEL LEVEL OF CARE
* *

ACCOM	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
PRIVATE	1.00	6	37	8	51
		11.8	72.5	15.7	19.3
		16.7	18.4	29.6	
		2.3	14.0	3.0	
SEMI-PRIVATE	2.00	10	72	8	90
		11.1	80.0	8.9	34.1
		27.8	35.8	29.6	
		3.8	27.3	3.0	
WARD	3.00	20	92	11	123
		16.3	74.8	8.9	46.6
		55.6	45.8	40.7	
		7.6	34.8	4.2	
	COLUMN TOTAL	36	201	27	264
		13.6	76.1	10.2	100.0

CHI SQUARE = 3.30654 WITH 4 DEGREES OF FREEDOM

TABLE 38

FILE THIRD (CREATION DATE = 02/27/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
AGE AGE BY LEVEL LEVEL OF CARE

AGE	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II .TWO 2.00	III THREE 3.00	ROW TOTAL
1.00 UNDER 20 YEARS	COUNT	4	6	0	10
	ROW PCT	40.0	60.0	0.0	3.8
	COL PCT	11.1	3.0	0.0	
	TOT PCT	1.5	2.3	0.0	
2.00 21-35 YEARS	COUNT	6	28	3	37
	ROW PCT	16.2	75.7	8.1	14.0
	COL PCT	16.7	13.9	11.1	
	TOT PCT	2.3	10.6	1.1	
3.00 36-50 YEARS	COUNT	8	39	3	50
	ROW PCT	16.0	78.0	6.0	18.9
	COL PCT	22.2	19.4	11.1	
	TOT PCT	3.0	14.8	1.1	
4.00 51-65 YEARS	COUNT	11	55	13	79
	ROW PCT	13.9	69.6	16.5	29.9
	COL PCT	30.6	27.4	48.1	
	TOT PCT	4.2	20.8	4.9	
5.00 66-80 YEARS	COUNT	6	44	7	57
	ROW PCT	10.5	77.2	12.3	21.6
	COL PCT	16.7	21.9	25.9	
	TOT PCT	2.3	16.7	2.7	
6.00 OVER 80 YEARS	COUNT	1	29	1	31
	ROW PCT	3.2	93.5	3.2	11.7
	COL PCT	2.8	14.4	3.7	
	TOT PCT	0.4	11.0	0.4	
COLUMN TOTAL		36	201	27	264
		13.6	76.1	10.2	100.0

CHI SQUARE = 17.18079 WITH 10 DEGREES OF FREEDOM

TABLE 39

FILE THIRD (CREATION DATE = 02/27/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
MARITAL MARITAL STATUS BY LEVEL LEVEL OF CAPE
* *

MARITAL	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MARRIED	1.00	20	131	19	170
		11.8	77.1	11.2	64.4
		55.6	65.2	70.4	
		7.6	49.6	7.2	
SINGLE	2.00	10	20	1	31
		32.3	64.5	3.2	11.7
		27.8	10.0	3.7	
		3.8	7.6	0.4	
WIDOWED	3.00	4	40	3	47
		8.5	85.1	6.4	17.8
		11.1	19.9	11.1	
		1.5	15.2	1.1	
DIVORCED	4.00	2	4	2	8
		25.0	50.0	25.0	3.0
		5.6	2.0	7.4	
		0.8	1.5	0.8	
SEPARATED	5.00	0	6	2	8
		0.0	75.0	25.0	3.0
		0.0	3.0	7.4	
		0.0	2.3	0.8	
	COLUMN TOTAL	36	201	27	264
		13.6	76.1	10.2	100.0

CHI SQUARE = 18.58745 WITH 8 DEGREES OF FREEDOM

TABLE 40

```
FILE    TOTAL     (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * *
    SEX        SEX                                                     . BY  LEVEL     LEVEL OF CARE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                     LEVEL
           COUNT   I
          ROW PCT  II ONE     II TWO    III THRE    ROW
          COL PCT  I                        E       TOTAL
          TOT PCT  I     1.00I     2.00I     3.00I
SEX       --------I--------I--------I--------I
            1.00  I     64  I    276  I     46  I    386
  MALE            I   16.6  I   71.5  I   11.9  I   48.8
                  I   69.6  I   47.3  I   39.7  I
                  I    8.1  I   34.9  I    5.8  I
                 -I--------I--------I--------I
            2.00  I     28  I    307  I     70  I    405
  FEMALE          I    6.9  I   75.8  I   17.3  I   51.2
                  I   30.4  I   52.7  I   60.3  I
                  I    3.5  I   38.8  I    8.8  I
                 -I--------I--------I--------I
          COLUMN        92       583       116       791
           TOTAL      11.6      73.7      14.7     100.0

CHI SQUARE =     20.25613 WITH   2 DEGREES OF FREEDOM
```

TABLE 41

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
WDTYPE TYPE OF WARD BY LEVEL LEVEL OF CARE
* *

WDTYPE	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MEDICAL	1.00	48	312	29	389
		12.3	80.2	7.5	49.2
		52.2	53.5	25.0	
		6.1	39.4	3.7	
SURGICAL	2.00	44	271	87	402
		10.9	67.4	21.6	50.8
		47.8	46.5	75.0	
		5.6	34.3	11.0	
	COLUMN TOTAL	92	583	116	791
		11.6	73.7	14.7	100.0

CHI SQUARE = 31.85214 WITH 2 DEGREES OF FREEDOM

TABLE 42

FILE TOTAL (CREATION DATE = 03/20/71)

C R O S S T A B U L A T I O N O F
WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE

WARD	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
5E MEDICAL	5.00	6 6.6 12.5 1.5	77 84.6 24.7 19.8	8 8.8 27.6 2.1	91 23.4
5W MEDICAL	6.00	6 6.5 12.5 1.5	79 85.9 25.3 20.3	7 7.6 24.1 1.8	92 23.7
6E MEDICAL	7.00	25 24.0 52.1 6.4	69 66.3 22.1 17.7	10 9.6 34.5 2.6	104 26.7
6W MEDICAL	8.00	11 10.8 22.9 2.8	87 85.3 27.9 22.4	4 3.9 13.8 1.0	102 26.2
	COLUMN TOTAL	48 12.3	312 80.2	29 7.5	389 100.0

CHI SQUARE = 22.68265 WITH 6 DEGREES OF FREEDOM

TABLE 43

FILE TOTAL (CREATION DATE = 03/20/71)

C R O S S T A B U L A T I O N O F
WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE

WARD	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
3E SURGICAL	1.00	8	74	18	100
		8.0	74.0	18.0	24.9
		18.2	27.3	20.7	
		2.0	18.4	4.5	
3W SURGICAL	2.00	4	57	37	98
		4.1	58.2	37.8	24.4
		9.1	21.0	42.5	
		1.0	14.2	9.2	
4E SURGICAL	3.00	17	67	14	98
		17.3	68.4	14.3	24.4
		38.6	24.7	16.1	
		4.2	16.7	3.5	
4W SURGICAL	4.00	15	73	18	106
		14.2	68.9	17.0	26.4
		34.1	26.9	20.7	
		3.7	18.2	4.5	
COLUMN TOTAL		44	271	87	402
		10.9	67.4	21.6	100.0

CHI SQUARE = 27.49319 WITH 6 DEGREES OF FREEDOM

TABLE 44

FILE TOTAL (CREATION DATE = 03/12/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * *
NSTUDENT NURSING STUDENTS? BY LEVEL LEVEL OF CARE
* *

NSTUDENT	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
NO	0.0	22	144	33	199
		11.1	72.4	16.6	25.2
		23.9	24.7	28.4	
		2.8	18.2	4.2	
YES	1.00	70	439	83	592
		11.8	74.2	14.0	74.8
		76.1	75.3	71.6	
		8.8	55.5	10.5	
	COLUMN TOTAL	92	583	116	791
		11.6	73.7	14.7	100.0

CHI SQUARE = 0.60769 WITH 2 DEGREES OF FREEDOM

TABLE 45

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
NSTUDENT NURSING STUDENTS? BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
WDTYPE TYPE OF WARD VALUE = 1.00 MEDICAL
* *

NSTUDENT	LEVEL COUNT ROW PCT COL PCT TOT PCT	II ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
NO	0.0	16 12.0 33.3 4.1	101 75.9 32.4 26.0	16 12.0 55.2 4.1	133 34.2
YES	1.00	32 12.5 66.7 8.2	211 82.4 67.6 54.2	13 5.1 44.8 3.3	256 65.8
	COLUMN TOTAL	48 12.3	312 80.2	29 7.5	389 100.0

CHI SQUARE = 6.14840 WITH 2 DEGREES OF FREEDOM

TABLE 46

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
NSTUDENT NURSING STUDENTS? BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
WDTYPE TYPE OF WARD VALUE = 2.00 SURGICAL
* *

NSTUDENT	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
NO	0.0	6	43	17	66
		9.1	65.2	25.8	16.4
		13.6	15.9	19.5	
		1.5	10.7	4.2	
YES	1.00	38	228	70	336
		11.3	67.9	20.8	83.6
		86.4	84.1	80.5	
		9.5	56.7	17.4	
	COLUMN TOTAL	44	271	87	402
		10.9	67.4	21.6	100.0

CHI SQUARE = 0.92606 WITH 2 DEGREES OF FREEDOM

TABLE 47

FILE TOTAL (CREATION DATE = 03/20/71)

C R O S S T A B U L A T I O N O F

WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

NSTUDENT NURSING STUDENTS? VALUE = 0.0 NO

WARD	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
SE MEDICAL	5.00	0 0.0 0.0 0.0	25 83.3 24.8 18.8	5 16.7 31.3 3.8	30 22.6
6E MEDICAL	7.00	9 25.0 56.3 6.8	20 55.6 19.8 15.0	7 19.4 43.8 5.3	36 27.1
6W MEDICAL	8.00	7 10.4 43.8 5.3	56 83.6 55.4 42.1	4 6.0 25.0 3.0	67 50.4
	COLUMN TOTAL	16 12.0	101 75.9	16 12.0	133 100.0

CHI SQUARE = 15.70984 WITH 4 DEGREES OF FREEDOM

TABLE 48

FILE TOTAL (CREATION DATE = 03/20/71)

* * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
NSTUDENT NURSING STUDENTS? VALUE = 0.0 NO

WARD	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
3E SURGICAL	1.00	0 0.0 0.0 0.0	22 64.7 51.2 33.3	12 35.3 70.6 18.2	34 51.5
4E SURGICAL	3.00	6 18.8 100.0 9.1	21 65.6 48.8 31.8	5 15.6 29.4 7.6	32 48.5
	COLUMN TOTAL	6 9.1	43 65.2	17 25.8	66 100.0

CHI SQUARE = 8.85313 WITH 2 DEGREES OF FREEDOM

TABLE 49

FILE TOTAL (CREATION DATE = 03/20/71)

C R O S S T A B U L A T I O N   O F
WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
NSTUDENT NURSING STUDENTS? VALUE = 1.00 YES

WARD	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
5E MEDICAL	5.00	6 9.8 18.8 2.3	52 85.2 24.6 20.3	3 4.9 23.1 1.2	61 23.8
5W MEDICAL	6.00	6 6.5 18.8 2.3	79 85.9 37.4 30.9	7 7.6 53.8 2.7	92 35.9
6E MEDICAL	7.00	16 23.5 50.0 6.3	49 72.1 23.2 19.1	3 4.4 23.1 1.2	68 26.6
6W MEDICAL	8.00	4 11.4 12.5 1.6	31 88.6 14.7 12.1	0 0.0 0.0 0.0	35 13.7
	COLUMN TOTAL	32 12.5	211 82.4	13 5.1	256 100.0

CHI SQUARE = 13.86489 WITH 6 DEGREES OF FREEDOM

TABLE 50

FILE TOTAL (CREATION DATE = 03/20/71)

C R O S S T A B U L A T I O N O F
WARD SPECIFIC WARD BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
NSTUDENT NURSING STUDENTS? VALUE = 1.00 YES

WARD	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
3E SURGICAL	1.00	8 12.1 21.1 2.4	52 78.8 22.8 15.5	6 9.1 8.6 1.8	66 19.6
3W SURGICAL	2.00	4 4.1 10.5 1.2	57 58.2 25.0 17.0	37 37.8 52.9 11.0	98 29.2
4E SURGICAL	3.00	11 16.7 28.9 3.3	46 69.7 20.2 13.7	9 13.6 12.9 2.7	66 19.6
4W SURGICAL	4.00	15 14.2 39.5 4.5	73 68.9 32.0 21.7	18 17.0 25.7 5.4	106 31.5
	COLUMN TOTAL	38 11.3	228 67.9	70 20.8	336 100.0

CHI SQUARE = 29.79886 WITH 6 DEGREES OF FREEDOM

TABLE 51

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * *
ACCOM ACCOMODATION BY LEVEL LEVEL OF CARE
* *

ACCOM	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
PRIVATE	1.00	16	117	26	159
		10.1	73.6	16.4	20.1
		17.4	20.1	22.4	
		2.0	14.8	3.3	
SEMI-PRIVATE	2.00	25	193	40	258
		9.7	74.8	15.5	32.6
		27.2	33.1	34.5	
		3.2	24.4	5.1	
WARD	3.00	51	273	50	374
		13.6	73.0	13.4	47.3
		55.4	46.8	43.1	
		6.4	34.5	6.3	
	COLUMN TOTAL	92	583	116	791
		11.6	73.7	14.7	100.0

CHI SQUARE = 3.39425 WITH 4 DEGREES OF FREEDOM

TABLE 52

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
AGE AGE BY LEVEL LEVEL OF CARE
* *

AGE	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
UNDER 20 YEARS	1.00	5	19	3	27
		18.5	70.4	11.1	3.4
		5.4	3.3	2.6	
		0.6	2.4	0.4	
21-35 YEARS	2.00	15	95	14	124
		12.1	76.6	11.3	15.7
		16.3	16.3	12.7	
		1.9	12.0	1.8	
36-50 YEARS	3.00	33	129	20	182
		18.1	70.9	11.0	23.0
		35.9	22.1	18.2	
		4.2	16.3	2.5	
51-65 YEARS	4.00	18	161	43	222
		8.1	72.5	19.4	28.1
		19.6	27.6	39.1	
		2.3	20.4	5.4	
66-80 YEARS	5.00	16	113	23	152
		10.5	74.3	15.1	19.2
		17.4	19.4	20.9	
		2.0	14.3	2.9	
OVER 80 YEARS	6.00	5	66	13	84
		6.0	78.6	15.5	10.6
		5.4	11.3	11.8	
		0.6	8.3	1.6	
	COLUMN TOTAL	92	583	110	791
		11.6	73.7	13.9	100.0

CHI SQUARE = 19.57820 WITH 10 DEGREES OF FREEDOM

TABLE 53

FILE TOTAL (CREATION DATE = 03/18/71)

* C R O S S T A B U L A T I O N O F * * * * * *
MARITAL MARITAL STATUS BY LEVEL LEVEL OF CARE
* *

MARITAL	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MARRIED	1.00	63	379	80	522
		12.1	72.6	15.3	66.0
		68.5	65.0	69.0	
		8.0	47.9	10.1	
SINGLE	2.00	16	71	6	93
		17.2	76.3	6.5	11.8
		17.4	12.2	5.2	
		2.0	9.0	0.8	
WIDOWED	3.00	6	96	21	123
		4.9	78.0	17.1	15.5
		6.5	16.5	18.1	
		0.8	12.1	2.7	
DIVORCED	4.00	3	18	4	25
		12.0	72.0	16.0	3.2
		3.3	3.1	3.4	
		0.4	2.3	0.5	
SEPARATED	5.00	4	17	5	26
		15.4	65.4	19.2	3.3
		4.3	2.9	4.3	
		0.5	2.1	0.6	
OTHER	6.00	0	2	0	2
		0.0	100.0	0.0	0.3
		0.0	0.3	0.0	
		0.0	0.3	0.0	
	COLUMN TOTAL	92	583	116	791
		11.6	73.7	14.7	100.0

CHI SQUARE = 14.48007 WITH 10 DEGREES OF FREEDOM

APPENDIX B

Ordinal Tests

- Kolmogorov-Smirnov
- Mann-Whitney U Test
- Kruskal-Wallis
- Spearman R

Data Collection Periods

- First
- Second
- Third
- Total Data-Producing Sample

Tables 54 to 112

TABLE 54

```
EV FIRST SEX(1=M,2=F) K-S

NUMBER OF OBSERVATIONS =  267
NUMBER OF ITEMS =    1
NUMBER OF RESPONSE CATEGORIES =    3
NUMBER OF GROUPS =    2
FORMAT OF DATA:      (15X,F1.0,T9 ,I1)

      ITEM  MEAN    SD

        1   1.99   0.55
        1   2.28   0.46

FREQUENCY

  1  1    21  93  20
  1  2     1  94  38

ITEM   1   FOR GROUP   1  AND GROUP   2
DMAX=   0.149   N1=   134.    N2=   133.
CHI SQUARE=   5.94331
```

TABLE 55

EV FIRST WARD(1=MED,2=SURG) K-S

```
NUMBER OF OBSERVATIONS =  267
NUMBER OF ITEMS =     1
NUMBER OF RESPONSE CATEGORIES =     3
NUMBER OF GROUPS =     2
FORMAT OF DATA:      (15X,F1.0,T13,I1)
```

```
        ITEM  MEAN    SD

           1  2.06   0.49
           1  2.21   0.56

    FREQUENCY

    1  1    12  99  20
    1  2    10  83  38

   ITEM   1   FOR GROUP   1  AND GROUP   2
   DMAX=   0.127   N1=   131.    N2=   136.
   CHI SQUARE=    4.28732
```

TABLE 56

```
EV FIRST STUDENTS(1=YES,2=NO) K-S

NUMBER OF OBSERVATIONS =   267
NUMBER OF ITEMS =      1
NUMBER OF RESPONSE CATEGORIES =     3
NUMBER OF GROUPS =     2
FORMAT OF DATA:       (15X,F1.0,T38,I1)

           ITEM  MEAN     SD

              1   2.23   0.51
              1   2.08   0.54

  FREQUENCY

  1  1     4  69  27
  1  2    18 118  31

ITEM   1   FOR GROUP   1  AND GROUP   2
DMAX=   0.084   N1=   100.     N2=   167.
CHI SQUARE=   1.78096
```

TABLE 57

```
EV FIRST  MEDICAL WARDS  NSTUDENT(1=YES,2=NO) K-S

NUMBER OF OBSERVATIONS =  131
NUMBER OF ITEMS =     1
NUMBER OF RESPONSE CATEGORIES =     3
NUMBER OF GROUPS =     2
FORMAT OF DATA:      (15X,F1.0,T38,I1)

     ITEM   MEAN    SD

       1    2.20   0.40
       1    2.02   0.51

FREQUENCY

  1  1      0   24    6
  1  2     12   75   14

ITEM    1    FOR GROUP    1   AND GROUP    2
DMAX=    0.119    N1=    30.    N2=   101.
CHI SQUARE=   1.30602
```

TABLE 58

```
EV FIRST SURGICAL WARDS   NSTUDENT(1=YES,2=NO) K-S

NUMBER OF OBSERVATIONS =   136
NUMBER OF ITEMS =      1
NUMBER OF RESPONSE CATEGORIES =     3
NUMBER OF GROUPS =     2
FORMAT OF DATA:     (15X,F1.0,T38,I1)

ITEM   MEAN    SD

  1    2.24   0.55
  1    2.17   0.57

FREQUENCY

 1   1      4   45   21
 1   2      6   43   17

ITEM    1    FOR GROUP    1   AND GROUP    2
DMAX=    0.042    N1=     70.     N2=     66.
CHI SQUARE=    0.24456
```

TABLE 59

```
        EV SECND SEX(1=M,2=F) K-S

NUMBER OF OBSERVATIONS =  260
NUMBER OF ITEMS =     1
NUMBER OF RESPONSE CATEGORIES =     3
NUMBER OF GROUPS =     2
FORMAT OF DATA:       (15X,F1.0,T9 ,I1)


        ITEM  MEAN    SD

          1   1.94   0.51
          1   2.03   0.48

 FREQUENCY

  1  1     20  90  13
  1  2     14 105  18


ITEM    1   FOR GROUP   1  AND GROUP   2
DMAX=   0.060   N1=   123.    N2=   137.
CHI SQUARE=   0.94614
```

TABLE 60

```
EV SEOND WARD(1=MED,2=SURG) K-S

NUMBER OF OBSERVATIONS =  260
NUMBER OF ITEMS =     1
NUMBER OF RESPONSE CATEGORIES =     3
NUMBER OF GROUPS =     2
FORMAT OF DATA:      (15X,F1.0,T13,I1)



     ITEM  MEAN    SD

       1   1.93   0.38
       1   2.05   0.59

 FREQUENCY

  1  1    14 108   5
  1  2    20  87  26


ITEM   1   FOR GROUP   1  AND GROUP   2
DMAX=   0.156   N1=   127.    N2=   133.
CHI SQUARE=   6.33361
```

TABLE 61

```
         EV SECND STUDENTS(1=YES,2=NO) K-S

NUMBER OF OBSERVATIONS =  260
NUMBER OF ITEMS =     1
NUMBER OF RESPONSE CATEGORIES =    3
NUMBER OF GROUPS =     2
FORMAT OF DATA:      (15X,F1.0,T38,I1)



        ITEM  MEAN    SD

          1   2.00   0.51
          1   1.94   0.43

 FREQUENCY

  1  1     30 169  29
  1  2      4  26   2

ITEM   1   FOR GROUP   1  AND GROUP   2
DMAX=   0.065   N1=   228.    N2=    32.
CHI SQUARE=   0.46977
```

TABLE 62

```
EV SECOND MEDICAL WARDS  NSTUDENT(1=YES,2=NO) K-S

NUMBER OF OBSERVATIONS =  127
NUMBER OF ITEMS =     1
NUMBER OF RESPONSE CATEGORIES =     3
NUMBER OF GROUPS =     2
FORMAT OF DATA:      (15X,F1.0,T38,I1)


      ITEM  MEAN    SD

         1  1.93   0.36
         1  1.94   0.43

 FREQUENCY

  1  1     10  82   3
  1  2      4  26   2

ITEM   1   FOR GROUP   1  AND GROUP   2
DMAX=   0.031   N1=    95.    N2=    32.
CHI SQUARE=   0.09155
```

TABLE 63

```
EV THIRD SEX(1=M,2=F) K-S

NUMBER OF OBSERVATIONS =  264
NUMBER OF ITEMS =     1
NUMBER OF RESPONSE CATEGORIES =    3
NUMBER OF GROUPS =     2
FORMAT OF DATA:      (15X,F1.0,T9 ,I1)


ITEM  MEAN    SD

  1   1.92   0.52
  1   2.01   0.45

FREQUENCY

 1  1    23  93  13
 1  2    13 108  14

ITEM   1   FOR GROUP   1  AND GROUP   2
DMAX=   0.082   N1=   129.    N2=   135.
CHI SQUARE=  1.77414
```

TABLE 64

```
EV THIRD WARD(1=MED,2=SURG) K-S

NUMBER OF OBSERVATIONS =  264
NUMBER OF ITEMS =     1
NUMBER OF RESPONSE CATEGORIES =    3
NUMBER OF GROUPS =    2
FORMAT OF DATA:      (15X,F1.0,T13,I1)


    ITEM  MEAN    SD

      1   1.86   0.42
      1   2.07   0.52

 FREQUENCY

  1  1    22 105   4
  1  2    14  96  23

ITEM   1   FOR GROUP   1  AND GROUP   2
DMAX=   0.142   N1=   131.    N2=   133.
CHI SQUARE=   5.35287
```

TABLE 65

```
EV TOTAL SEX(1=M,2=F) K-S

NUMBER OF OBSERVATIONS =  791
NUMBER OF ITEMS =     1
NUMBER OF RESPONSE CATEGORIES =    3
NUMBER OF GROUPS =     2
FORMAT OF DATA:      (15X,F1.0,T9 ,I1)



        ITEM  MEAN    SD

          1   1.95   0.53
          1   2.10   0.48

 FREQUENCY

  1  1    64 276  46
  1  2    28 307  70


ITEM   1   FOR GROUP   1  AND GROUP   2
DMAX=   0.097   N1=   336.    N2=   405.
CHI SQUARE=   7.38728
```

TABLE 66

```
EV TOTAL WARD(1=MED.2=SURG) K-S

NUMBER OF OBSERVATIONS =  791
NUMBER OF ITEMS =     1
NUMBER OF RESPONSE CATEGORIES =    3
NUMBER OF GROUPS =     2
FORMAT OF DATA:      (15X,F1.0,T13.I1)


   ITEM  MEAN    SD

     1   1.95   0.44
     1   2.11   0.56

FREQUENCY

 1  1    48 312  29
 1  2    44 271  87


ITEM    1   FOR GROUP   1  AND GROUP   2
DMAX=   0.142   N1=   389.    N2=   402.
CHI SQUARE=  15.91574
```

TABLE 67

```
EV TOTAL STUDENTS(1=YES,2=NO) K-S

NUMBER OF OBSERVATIONS =  791
NUMBER OF ITEMS =     1
NUMBER OF RESPONSE CATEGORIES =    3
NUMBER OF GROUPS =    2
FORMAT OF DATA:     (15X,F1.0,T38,I1)


ITEM  MEAN    SD

  1   2.02   0.51
  1   2.06   0.52

FREQUENCY

 1  1    70 439  83
 1  2    22 144  33

ITEM   1   FOR GROUP   1  AND GROUP   2
DMAX=   0.026   N1=   592.    N2=   199.
CHI SQUARE=   0.39123
```

TABLE 68

```
EV FIRST SEX(1=F,2=M) M-W

     NO. OF FORMAT CARDS =      1
     NO. OF OBSERVATIONS =    267
     NO. OF INPUT VARIABLES =     1
     TOTAL NO. OF VARIABLES =     1
     SPECIFICATIONS FOR THIS PROBLEM
          NO RANK CORRELATIONS
          MANN-WHITNEY U-TEST BETWEEN SUCCESSIVE GROUPS-SMALLER GROUP FIRST
          NO COEFFICIENT OF CONCORDANCE
          DATA IS UNRANKED
          DATA INPUT FROM CARDS
     (15X,F1.0)
     NO. IN GROUP 1 =    133       NO. IN GROUP 2 =    134
  MANN-WHITNEY U'S AND NORMAL DEVIATES 'POS' INDICATES THE GROUP HAVING THE HIGHER RANKS
L  VARIABLE        U             Z        POS

     1       6754.500      -4.254     1.
```

TABLE 69

```
EV FIRST WARD(1=MED,2=SURG) M-W

     NO. OF FORMAT CARDS =      1
     NO. OF OBSERVATIONS =    267
     NO. OF INPUT VARIABLES =     1
     TOTAL NO. OF VARIABLES =     1
     SPECIFICATIONS FOR THIS PROBLEM
          NO RANK CORRELATIONS
          MANN-WHITNEY U-TEST BETWEEN SUCCESSIVE GROUPS-SMALLER GROUP FIRST
          NO COEFFICIENT OF CONCORDANCE
          DATA IS UNRANKED
          DATA INPUT FROM CARDS
     (15X,F1.0)
     NO. IN GROUP 1 =   131       NO. IN GROUP 2 =   136
MANN-WHITNEY U'S AND NORMAL DEVIATES 'POS' INDICATES THE GROUP HAVING THE HIGHER RANKS
 VARIABLE        U              Z        POS

     1       7746.000       -2.293      2.
```

TABLE 70

```
EV FIRST  MEDICAL WARDS  NSTUDENT(1=YES,2=NO) M-W

    NO. OF FORMAT CARDS =      1
    NO. OF OBSERVATIONS =    131
    NO. OF INPUT VARIABLES =     1
    TOTAL NO. OF VARIABLES =     1
    SPECIFICATIONS FOR THIS PROBLEM
         NO RANK CORRELATIONS
         MANN-WHITNEY U-TEST BETWEEN SUCCESSIVE GROUPS-SMALLER GROUP FIRST
         NO COEFFICIENT OF CONCORDANCE
         DATA IS UNRANKED
         DATA INPUT FROM CARDS
    (15X,F1.0)
    NO. IN GROUP 1 =     30    NO. IN GROUP 2 =   101

MANN-WHITNEY U'S AND NORMAL DEVIATES 'POS' INDICATES THE GROUP HAVING THE HIGHER RANKS
 VARIABLE        U            Z      POS

   1      1278.000      -1.728    1.
```

TABLE 71

```
EV FIRST SURGICAL WARDS  NSTUDENT(1=NO,2=YES) M-W

     NO. OF FORMAT CARDS =       1
     NO. OF OBSERVATIONS =     136
     NO. OF INPUT VARIABLES =      1
     TOTAL NO. OF VARIABLES =      1
     SPECIFICATIONS FOR THIS PROBLEM
          NO RANK CORRELATIONS
          MANN-WHITNEY U-TEST BETWEEN SUCCESSIVE GROUPS-SMALLER GROUP FIRST
          NO COEFFICIENT OF CONCORDANCE
          DATA IS UNRANKED
          DATA INPUT FROM CARDS
     (15X,F1.0)
     NO. IN GROUP 1 =      66      NO. IN GROUP 2 =      70

MANN-WHITNEY U'S AND NORMAL DEVIATES 'POS' INDICATES THE GROUP HAVING THE HIGHER RANKS
 VARIABLE       U            Z      POS

    1       2163.000     -0.761    2.
```

TABLE 72

```
EV FIRST STUDENTS(1=YES,2=NO) M-W

     NO. OF FORMAT CARDS =       1
     NO. OF OBSERVATIONS =     267
     NO. OF INPUT VARIABLES =    1
     TOTAL NO. OF VARIABLES =    1
     SPECIFICATIONS FOR THIS PROBLEM
          NO RANK CORRELATIONS
          MANN-WHITNEY U-TEST BETWEEN SUCCESSIVE GROUPS-SMALLER GROUP FIRST
          NO COEFFICIENT OF CONCORDANCE
          DATA IS UNRANKED
          DATA INPUT FROM CARDS
     (15X,F1.0)
     NO. IN GROUP 1 =   100     NO. IN GROUP 2 =   167
MANN-WHITNEY U'S AND NORMAL DEVIATES 'POS' INDICATES THE GROUP HAVING THE HIGHER RANKS
 VARIABLE       U            Z       POS

    1       7260.500     -2.220     1.
```

TABLE 73

```
EV SECOND SEX(1=M,2=F) M-W

    NO. OF FORMAT CARDS =      1
    NO. OF OBSERVATIONS =    260
    NO. OF INPUT VARIABLES =      1
    TOTAL NO. OF VARIABLES =      1
    SPECIFICATIONS FOR THIS PROBLEM
         NO RANK CORRELATIONS
         MANN-WHITNEY U-TEST BETWEEN SUCCESSIVE GROUPS-SMALLER GROUP FIRST
         NO COEFFICIENT OF CONCORDANCE
         DATA IS UNRANKED
         DATA INPUT FROM CARDS
    (15X,F1.0)
    NO. IN GROUP 1 =   123      NO. IN GROUP 2 =   137


MANN-WHITNEY U'S AND NORMAL DEVIATES 'POS' INDICATES THE GROUP HAVING THE HIGHER RANKS
 VARIABLE       U           Z      POS

   1        7789.000     -1.387    2.
```

TABLE 74

```
EV SECND WARD(1=MED,2=SURG) M-W

     NO. OF FORMAT CARDS =       1
     NO. OF OBSERVATIONS =     260
     NO. OF INPUT VARIABLES =       1
     TOTAL NO. OF VARIABLES =       1
     SPECIFICATIONS FOR THIS PROBLEM
          NO RANK CORRELATIONS
          MANN-WHITNEY U-TEST BETWEEN SUCCESSIVE GROUPS-SMALLER GROUP FIRST
          NO COEFFICIENT OF CONCORDANCE
          DATA IS UNRANKED
          DATA INPUT FROM CARDS
     (15X,F1.0)
     NO. IN GROUP 1 =    127      NO. IN GROUP 2 =    133


MANN-WHITNEY U'S AND NORMAL DEVIATES 'POS' INDICATES THE GROUP HAVING THE HIGHER RANKS
 VARIABLE        U              Z      POS

    1      7598.000      -1.845    2.
```

TABLE 75

```
EV SECOND STUDENTS (1=NO,2=YES) M-W

    NO. OF FORMAT CARDS =      1
    NO. OF OBSERVATIONS =    260
    NO. OF INPUT VARIABLES =      1
    TOTAL NO. OF VARIABLES =      1
    SPECIFICATIONS FOR THIS PROBLEM
         NO RANK CORRELATIONS
         MANN-WHITNEY U-TEST BETWEEN SUCCESSIVE GROUPS-SMALLER GROUP FIRST
         NO COEFFICIENT OF CONCORDANCE
         DATA IS UNRANKED
         DATA INPUT FROM CARDS
    (15X,F1.0)
    NO. IN GROUP 1 =    32      NO. IN GROUP 2 =   228


MANN-WHITNEY U'S AND NORMAL DEVIATES 'POS' INDICATES THE GROUP HAVING THE HIGHER RANKS
 VARIABLE       U            Z      POS

    1       3464.000      -0.610    2.
```

TABLE 76

```
EV SECOND MEDICAL WARDS  NSTUDENT(1=YES,2=NO) M-W

    NO. OF FORMAT CARDS =       1
    NO. OF OBSERVATIONS =     127
    NO. OF INPUT VARIABLES =      1
    TOTAL NO. OF VARIABLES =      1
    SPECIFICATIONS FOR THIS PROBLEM
          NO RANK CORRELATIONS
          MANN-WHITNEY U-TEST BETWEEN SUCCESSIVE GROUPS-SMALLER GROUP FIRST
          NO COEFFICIENT OF CONCORDANCE
          DATA IS UNRANKED
          DATA INPUT FROM CARDS
    (15X,F1.0)
    NO. IN GROUP 1 =     32      NO. IN GROUP 2 =     95

MANN-WHITNEY U'S AND NORMAL DEVIATES 'POS' INDICATES THE GROUP HAVING THE HIGHER RANKS
 VARIABLE        U              Z      POS

    1       1498.000      -0.197    1.
```

TABLE 77

```
EV  THIRD SEX(1=M,2=F) M-W

     NO. OF FORMAT CARDS =       1
     NO. OF OBSERVATIONS =     264
     NO. OF INPUT VARIABLES =     1
     TOTAL NO. OF VARIABLES =     1
     SPECIFICATIONS FOR THIS PROBLEM
          NO RANK CORRELATIONS
          MANN-WHITNEY U-TEST BETWEEN SUCCESSIVE GROUPS-SMALLER GROUP FIRST
          NO COEFFICIENT OF CONCORDANCE
          DATA IS UNRANKED
          DATA INPUT FROM CARDS
     (15X,F1.0)
     NO. IN GROUP 1 =    129      NO. IN GROUP 2 =    135


MANN-WHITNEY U'S AND NORMAL DEVIATES 'POS' INDICATES THE GROUP HAVING THE HIGHER RANKS
 VARIABLE       U            Z      POS

    1       8044.500     -1.435    2.
```

TABLE 78

```
EV THIRD WARD(1=MED,2=SURG) K-W

    NC. OF FORMAT CARDS =      1
    NO. OF OBSERVATIONS =    264
    NO. OF INPUT VARIABLES =     1
    TOTAL NO. OF VARIABLES =     1
    SPECIFICATIONS FOR THIS PROBLEM
          NO RANK CORRELATIONS
          MANN-WHITNEY U-TEST BETWEEN SUCCESSIVE GROUPS-SMALLER GROUP FIRST
          NO COEFFICIENT OF CONCORDANCE
          DATA IS UNRANKED
          DATA INPUT FROM CARDS
    (15X,F1.0)
    NO. IN GROUP 1 =   131     NO. IN GROUP 2 =   133


MANN-WHITNEY U'S AND NORMAL DEVIATES 'POS' INDICATES THE GROUP HAVING THE HIGHER RANKS
 VARIABLE       U           Z      POS

    1      7150.000     -3.379    2.
```

TABLE 79

```
EV  TOTAL SEX(1=M,2=F) M-W .

    NO. OF FORMAT CARDS =      1
    NO. OF OBSERVATIONS =    791
    NO. OF INPUT VARIABLES =     1
    TOTAL NO. OF VARIABLES =     1
    SPECIFICATIONS FOR THIS PROBLEM
         NO RANK CORRELATIONS
         MANN-WHITNEY U-TEST BETWEEN SUCCESSIVE GROUPS-SMALLER GROUP FIRST
         NO COEFFICIENT OF CONCORDANCE
         DATA IS UNRANKED
         DATA INPUT FROM CARDS
    (15X,F1.0)
    NO. IN GROUP 1 =   386     NO. IN GROUP 2 =   405


MANN-WHITNEY U'S AND NORMAL DEVIATES 'POS' INDICATES THE GROUP HAVING THE HIGHER RANKS
 VARIABLE       U            Z      POS

   1     68010.000     -4.099    2.
```

TABLE 80

```
EV TOTAL WARD(1=MED,2=SURG) M-W

     NO. OF FORMAT CARDS =      1
     NO. OF OBSERVATIONS =    791
     NO. OF INPUT VARIABLES =      1
     TOTAL NO. OF VARIABLES =      1
     SPECIFICATIONS FOR THIS PROBLEM
          NO RANK CORRELATIONS
          MANN-WHITNEY U-TEST BETWEEN SUCCESSIVE GROUPS-SMALLER GROUP FIRST
          NO COEFFICIENT OF CONCORDANCE
          DATA IS UNRANKED
          DATA INPUT FROM CARDS
     (15X,F1.0)
     NO. IN GROUP 1 =   389      NO. IN GROUP 2 =   402


MANN-WHITNEY U'S AND NORMAL DEVIATES 'POS' INDICATES THE GROUP HAVING THE HIGHER RANKS
 VARIABLE       U            Z      POS

    1      67456.500     -4.331    2.
```

TABLE 81

EV TOTAL STUDENTS (1=NO,2=YES) M-W

```
NO. OF FORMAT CARDS =      1
NO. OF OBSERVATIONS =    791
NO. OF INPUT VARIABLES =      1
TOTAL NO. OF VARIABLES =      1
SPECIFICATIONS FOR THIS PROBLEM
     NO RANK CORRELATIONS
     MANN-WHITNEY U-TEST BETWEEN SUCCESSIVE GROUPS-SMALLER GROUP FIRST
     NO COEFFICIENT OF CONCORDANCE
     DATA IS UNRANKED
     DATA INPUT FROM CARDS
(15X.F1.0)
NO. IN GROUP 1 =   199     NO. IN GROUP 2 =   592
```

MANN-WHITNEY U'S AND NORMAL DEVIATES 'POS' INDICATES THE GROUP HAVING THE HIGHER RANKS

VARIABLE	U	Z	POS
1	57183.500	-0.800	1.

TABLE 82

```
EV TOTAL MEDICAL WARDS  NSTUDENT(1=NO,2=YES) M-W

   NO. OF FORMAT CARDS =      1
   NO. OF OBSERVATIONS =   389
   NO. OF INPUT VARIABLES =     1
   TOTAL NO. OF VARIABLES =     1
   SPECIFICATIONS FOR THIS PROBLEM
        NO RANK CORRELATIONS
        MANN-WHITNEY U-TEST BETWEEN SUCCESSIVE GROUPS-SMALLER GROUP FIRST
        NO COEFFICIENT OF CONCORDANCE
        DATA IS UNRANKED
        DATA INPUT FROM CARDS
   (15X,F1.0)
   NO. IN GROUP 1 =   133     NO. IN GROUP 2 =   256


MANN-WHITNEY U'S AND NORMAL DEVIATES 'POS' INDICATES THE GROUP HAVING THE HIGHER RANKS
 VARIABLE       U            Z      POS

   1     15912.500     -1.522    1.
```

TABLE 83

```
EV TOTAL SURGICAL WARDS  NSTUDENT(1=NO,2=YES) N-W

     NO. OF FORMAT CARDS =      1
     NO. OF OBSERVATIONS =    402
     NO. OF INPUT VARIABLES =      1
     TOTAL NO. OF VARIABLES =      1
     SPECIFICATIONS FOR THIS PROBLEM
           NO RANK CORRELATIONS
           MANN-WHITNEY U-TEST BETWEEN SUCCESSIVE GROUPS-SMALLER GROUP FIRST
           NO COEFFICIENT OF CONCORDANCE
           DATA IS UNRANKED
           DATA INPUT FROM CARDS
     (15X,F1.0)
     NO. IN GROUP 1 =    66      NO. IN GROUP 2 =   336


MANN-WHITNEY U'S AND NORMAL DEVIATES 'POS' INDICATES THE GROUP HAVING THE HIGHER RANKS
 VARIABLE       U            Z      POS

   1      10409.000     -0.953    1.
```

TABLE 84

```
EV FIRST MEDICAL WARDS ONLY, SPECIFIC WARD(5-8) K-W

        NO. OF FORMAT CARDS =       1
        NO. OF OBSERVATIONS =     131
        NO. OF INPUT VARIABLES =        1
        TOTAL NO. OF VARIABLES =        1
        SPECIFICATIONS FOR THIS PROBLEM
              NO RANK CORRELATIONS
              KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
              NO COEFFICIENT OF CONCORDANCE
              DATA IS UNRANKED
              DATA INPUT FROM CARDS
        (15X,F1.0)
        NO. OF GROUPS =    4
              GROUP NUMBER          1     2     3     4
              NO. IN GROUP         30.   30.   36.   35.

  KRUSKAL-WALLIS ANALYSIS OF VARIANCE

  VARIABLE          H           DF        SUMS OF RANKS
      1           6.592        3.00   2157.50  2217.00  2149.00  2122.50
```

TABLE 85

```
EV FIRST SURGCAL WARDS ONLY. SPECIFIC WARD(1-4) K-W

        NO. OF FORMAT CARDS =       1
        NO. OF OBSERVATIONS =     136
        NO. OF INPUT VARIABLES =       1
        TOTAL NO. OF VARIABLES =       1
        SPECIFICATIONS FOR THIS PROBLEM
              NO RANK CORRELATIONS
              KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
              NO COEFFICIENT OF CONCORDANCE
              DATA IS UNRANKED
              DATA INPUT FROM CARDS
        (15X,F1.0)
        NO. OF GROUPS =    4
              GROUP NUMBER           1     2     3     4
              NO. IN GROUP         34.   33.   32.   37.

   KRUSKAL-WALLIS ANALYSIS OF VARIANCE

  VARIABLE          H            DF        SUMS OF RANKS
      1          14.520         3.00  2609.00  2694.50  1765.00  2247.50
```

TABLE 86

```
EV FIRST ACCOM K-W

        NO. OF FORMAT CARDS =      1
        NO. OF OBSERVATIONS =    267
        NO. OF INPUT VARIABLES =       1
        TOTAL NO. OF VARIABLES =       1
        SPECIFICATIONS FOR THIS PROBLEM
              NO RANK CORRELATIONS
              KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
              NO COEFFICIENT OF CONCORDANCE
              DATA IS UNRANKED
              DATA INPUT FROM CARDS
        (15X,F1.0)
        NO. OF GROUPS =    3
              GROUP NUMBER           1     2     3
              NO. IN GROUP          57.   86.  124.

     KRUSKAL-WALLIS ANALYSIS OF VARIANCE

    VARIABLE          H           DF        SUMS OF RANKS
       1            0.709        2.00   7541.50 11921.50 16315.00
```

TABLE 87

```
EV FIRST AGE K-W

     NO. OF FORMAT CARDS =      1
     NO. OF OBSERVATIONS =    267
     NO. OF INPUT VARIABLES =      1
     TOTAL NO. OF VARIABLES =      1
     SPECIFICATIONS FOR THIS PROBLEM
          NO RANK CORRELATIONS
          KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
          NO COEFFICIENT OF CONCORDANCE
          DATA IS UNRANKED
          DATA INPUT FROM CARDS
     (15X,F1.0)
     NO. OF GROUPS =    6
          GROUP NUMBER            1     2     3     4     5     6
          NO. IN GROUP           7.   51.   58.   68.   59.   24.

  KRUSKAL-WALLIS ANALYSIS OF VARIANCE

  VARIABLE          H           DF        SUMS OF RANKS
     1            5.554        5.00   1057.00  6496.00  7239.50  9902.00  7651.00  3432.50
```

TABLE 88

```
EV FIRST MARITAL STATUS  K-W

    NO. OF FORMAT CARDS =       1
    NO. OF OBSERVATIONS =     267
    NO. OF INPUT VARIABLES =      1
    TOTAL NO. OF VARIABLES =      1
    SPECIFICATIONS FOR THIS PROBLEM
         NO RANK CORRELATIONS
         KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
         NO COEFFICIENT OF CONCORDANCE
         DATA IS UNRANKED
         DATA INPUT FROM CARDS
    (15X,F1.0)
    NO. OF GROUPS =    5
         GROUP NUMBER          1     2     3     4     5
         NO. IN GROUP        184.   29.   37.    7.   10.

KRUSKAL-WALLIS ANALYSIS OF VARIANCE

VARIABLE          H           DF        SUMS OF RANKS
   1           10.387        4.00 24118.00  3540.50  5884.50   707.50  1527.50
```

TABLE 89

```
SECOND MEDICAL WARDS ONLY, SPECIFIC WARD(5-8) K-W

  NO. OF FORMAT CARDS =       1
  NO. OF OBSERVATIONS =     127
  NO. OF INPUT VARIABLES =      1
  TOTAL NO. OF VARIABLES =      1
  SPECIFICATIONS FOR THIS PROBLEM
        NO RANK CORRELATIONS
        KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
        NO COEFFICIENT OF CONCORDANCE
        DATA IS UNRANKED
        DATA INPUT FROM CARDS
  (15X,F1.0)
  NO. OF GROUPS =    4
        GROUP NUMBER          1     2     3     4
        NO. IN GROUP         29.   31.   35.   32.

KRUSKAL-WALLIS ANALYSIS OF VARIANCE

VARIABLE          H            DF        SUMS OF RANKS
   1            1.562         3.00   1977.50  1940.50  2149.00  2061.00
```

TABLE 90

```
SECOND SURGICAL WARDS ONLY, SPECIFIC WARD(1-4) K-W

    NO. OF FORMAT CARDS =       1
    NO. OF OBSERVATIONS =     133
    NO. OF INPUT VARIABLES =      1
    TOTAL NO. OF VARIABLES =      1
    SPECIFICATIONS FOR THIS PROBLEM
         NO RANK CORRELATIONS
         KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
         NO COEFFICIENT OF CONCORDANCE
         DATA IS UNRANKED
         DATA INPUT FROM CARDS
    (15X,F1.0)
    NO. OF GROUPS =    4
         GROUP NUMBER           1     2     3     4
         NO. IN GROUP         33.   34.   33.   33.

KRUSKAL-WALLIS ANALYSIS OF VARIANCE

VARIABLE          H            DF        SUMS OF RANKS
    1          11.338         3.00  1960.50   2803.50   1960.50   2186.50
```

TABLE 91

```
EV SECOND ACCOM K-W

     NO. OF FORMAT CARDS =      1
     NO. OF OBSERVATIONS =    260
     NO. OF INPUT VARIABLES =      1
     TOTAL NO. OF VARIABLES =      1
     SPECIFICATIONS FOR THIS PROBLEM
          NO RANK CORRELATIONS
          KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
          NO COEFFICIENT OF CONCORDANCE
          DATA IS UNRANKED
          DATA INPUT FROM CARDS
     (15X,F1.0)
     NO. OF GROUPS =    3
          GROUP NUMBER          1    2    3
          NO. IN GROUP         51.  82. 127.

KRUSKAL-WALLIS ANALYSIS OF VARIANCE

VARIABLE         H          DF        SUMS OF RANKS
    1          1.264        2.00   6836.00 11036.50 16057.50
```

TABLE 92

```
EV SECOND AGE -  K-W

   NO. OF FORMAT CARDS =        1
   NO. OF OBSERVATIONS =      260
   NO. OF INPUT VARIABLES =     1
   TOTAL NO. OF VARIABLES =     1
   SPECIFICATIONS FOR THIS PROBLEM
         NO RANK CORRELATIONS
         KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
         NO COEFFICIENT OF CONCORDANCE
         DATA IS UNRANKED
         DATA INPUT FROM CARDS
   (15X,F1.0)
   NO. OF GROUPS =    6
         GROUP NUMBER          1     2     3     4     5     6
         NO. IN GROUP         10.   36.   74.   75.   36.   29.


KRUSKAL-WALLIS ANALYSIS OF VARIANCE


VARIABLE        H            DF       SUMS OF RANKS
   1          10.706         5.00   1318.50  4520.00  8499.50 10635.00  4743.00  4164.00
```

TABLE 93

```
SECOND MARITAL STATUS  K-W

    NO. OF FORMAT CARDS =       1
    NO. OF OBSERVATIONS =     260
    NO. OF INPUT VARIABLES =      1
    TOTAL NO. OF VARIABLES =      1
    SPECIFICATIONS FOR THIS PROBLEM
          NO RANK CORRELATIONS
          KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
          NO COEFFICIENT OF CONCORDANCE
          DATA IS UNRANKED
          DATA INPUT FROM CARDS
    (15X,F1.0)
    NO. OF GROUPS =   5
          GROUP NUMBER          1     2     3     4     5
          NO. IN GROUP        168.   33.   39.   10.   10.

KRUSKAL-WALLIS ANALYSIS OF VARIANCE

VARIABLE          H           DF         SUMS OF RANKS
    1           9.366        4.00 21912.50  4125.50  5484.00  1546.00   862.00
```

TABLE 94

```
THIRD MEDICAL WARDS ONLY, SPECIFIC WARD(5-8) K-W

 NO. OF FORMAT CARDS =      1
 NO. OF OBSERVATIONS =    131
 NO. OF INPUT VARIABLES =     1
 TOTAL NO. OF VARIABLES =     1
 SPECIFICATIONS FOR THIS PROBLEM
      NO RANK CORRELATIONS
      KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
      NO COEFFICIENT OF CONCORDANCE
      DATA IS UNRANKED
      DATA INPUT FRON CARDS
(15X,F1.0)
NO. OF GROUPS =   4
      GROUP NUMBER          1     2     3     4
      NO. IN GROUP        32.   31.   33.   35.

KRUSKAL-WALLIS ANALYSIS OF VARIANCE

VARIABLE         H          DF       SUMS OF RANKS
   1           5.205       3.00   2200.50  2189.00  1885.50  2371.00
```

TABLE 95

```
THIRDSURGICAL WARDS ONLY, SPECIFIC WARD(1-4) K-W

NO. OF FORMAT CARDS =       1
NO. OF OBSERVATIONS =     133
NO. OF INPUT VARIABLES =      1
TOTAL NO. OF VARIABLES =      1
SPECIFICATIONS FOR THIS PROBLEM
     NO RANK CORRELATIONS
     KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
     NO COEFFICIENT OF CONCORDANCE
     DATA IS UNRANKED
     DATA INPUT FROM CARDS
(15X,F1.0)
NO. OF GROUPS =   4
     GROUP NUMBER          1     2     3     4
     NO. IN GROUP         33.   31.   33.   36.


KRUSKAL-WALLIS ANALYSIS OF VARIANCE

VARIABLE          H          DF       SUMS OF RANKS
   1            5.592        3.00  2131.00  2418.00  2144.50  2217.50
```

TABLE 96

```
EV  THIRD ACCOM K-W

     NO. OF FORMAT CARDS =      1
     NO. OF OBSERVATIONS =    264
     NO. OF INPUT VARIABLES =     1
     TOTAL NO. OF VARIABLES =     1
     SPECIFICATIONS FOR THIS PROBLEM
          NO RANK CORRELATIONS
          KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
          NO COEFFICIENT OF CONCORDANCE
          DATA IS UNRANKED
          DATA INPUT FROM CARDS
     (15X,F1.0)
     NO. OF GROUPS =   3
          GROUP NUMBER          1    2    3
          NO. IN GROUP        51.  90. 123.


KRUSKAL-WALLIS ANALYSIS OF VARIANCE


VARIABLE         H           DF       SUMS OF RANKS
   1           1.977         2.00  7188.00 12057.00 15735.00
```

TABLE 97

```
EV  THIRD AGE -  K-W

    NO. OF FORMAT CARDS =      1
    NO. OF OBSERVATIONS =    264
    NO. OF INPUT VARIABLES =      1
    TOTAL NO. OF VARIABLES =      1
    SPECIFICATIONS FOR THIS PROBLEM
         NO RANK CORRELATIONS
         KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
         NO COEFFICIENT OF CONCORDANCE
         DATA IS UNRANKED
         DATA INPUT FROM CARDS
    (15X,F1.0)
    NO. OF GROUPS =    6
         GROUP NUMBER          1     2     3     4     5     6
         NO. IN GROUP         10.   37.   50.   79.   57.   31.


KRUSKAL-WALLIS ANALYSIS OF VARIANCE

VARIABLE        H          DF       SUMS OF RANKS
    1         8.863        5.00    896.00  4700.00  6244.00 11001.50  7896.00  4242.50
```

TABLE 98

```
THIRD MARITAL STATUS  K-W

 NO. OF FORMAT CARDS =      1
 NO. OF OBSERVATIONS =    264
 NO. OF INPUT VARIABLES =     1
 TOTAL NO. OF VARIABLES =     1
 SPECIFICATIONS FOR THIS PROBLEM
      NO RANK CORRELATIONS
      KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
      NO COEFFICIENT OF CONCORDANCE
      DATA IS UNRANKED
      DATA INPUT FROM CARDS
 (15X,F1.0)
 NO. OF GROUPS =   5
      GROUP NUMBER          1     2     3     4     5
      NO. IN GROUP        170.   31.   47.    8.    8.


KRUSKAL-WALLIS ANALYSIS OF VARIANCE


VARIABLE          H          DF        SUMS OF RANKS
   1            11.983       4.00 23086.00  3176.00  6307.00  1087.00  1324.00
```

TABLE 99

```
EV TOTAL MEDICAL WARDS ONLY, SPECIFIC WARD(5-8) K-W

     NO. OF FORMAT CARDS =      1
     NO. OF OBSERVATIONS =    389
     NO. OF INPUT VARIABLES =     1
     TOTAL NO. OF VARIABLES =     1
     SPECIFICATIONS FOR THIS PROBLEM
          NO RANK CORRELATIONS
          KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
          NO COEFFICIENT OF CONCORDANCE
          DATA IS UNRANKED
          DATA INPUT FROM CARDS
     (15X,F1.0)
     NO. OF GROUPS =    4
          GROUP NUMBER          1     2     3     4
          NO. IN GROUP         91.   92.  104.  102.

KRUSKAL-WALLIS ANALYSIS OF VARIANCE

VARIABLE          H            DF          SUMS OF RANKS
   1            9.448         3.00 18893.50 18927.50 18473.00 19561.00
```

TABLE 100

```
EV TOTAL SURGCAL WARDS ONLY, SPECIFIC WARD(1-4) K-W

        NO. OF FORMAT CARDS =        1
        NO. OF OBSERVATIONS =      402
        NO. OF INPUT VARIABLES =       1
        TOTAL NO. OF VARIABLES =       1
        SPECIFICATIONS FOR THIS PROBLEM
             NO RANK CORRELATIONS
             KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
             NO COEFFICIENT OF CONCORDANCE
             DATA IS UNRANKED
             DATA INPUT FROM CARDS
        (15X,F1.0)
        NO. OF GROUPS =    4
             GROUP NUMBER          1     2     3    4
             NO. IN GROUP        100.   98.   98. 106.

KRUSKAL-WALLIS ANALYSIS OF VARIANCE

VARIABLE          H           DF        SUMS OF RANKS
    1          24.584        3.00 19962.00 23633.00 17468.50 19939.50
```

TABLE 101

```
EV TOTAL ACCCM K-W

     NO. OF FORMAT CARDS =      1
     NO. OF OBSERVATIONS =    791
     NO. OF INPUT VARIABLES =      1
     TOTAL NO. OF VARIABLES =      1
     SPECIFICATIONS FOR THIS PROBLEN
          NO RANK CORRELATIONS
          KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
          NO COEFFICIENT OF CONCORDANCE
          DATA IS UNRANKED
          DATA INPUT FROM CARDS
     (15X,F1.0)
     NO. OF GROUPS =   3
          GROUP NUMBER          1    2    3
          NO. IN GROUP       159. 258. 374.

KRUSKAL-WALLIS ANALYSIS OF VARIANCE

VARIABLE          H           DF        SUMS OF RANKS
   1            2.922         2.00 64743.00104614.50143878.50
```

TABLE 102

```
EV TOTAL AGE K-W

  NO. OF FORMAT CARDS =      1
  NO. OF OBSERVATIONS =    791
  NO. OF INPUT VARIABLES =     1
  TOTAL NO. OF VARIABLES =     1
  SPECIFICATIONS FOR THIS PROBLEM
       NO RANK CORRELATIONS
       KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
       NO COEFFICIENT OF CONCORDANCE
       DATA IS UNRANKED
       DATA INPUT FROM CARDS
  (15X,F1.0)
  NO. OF GROUPS =   6
       GROUP NUMBER          1    2    3    4    5    6
       NO. IN GROUP        27. 124. 182. 222. 152.  84.

KRUSKAL-WALLIS ANALYSIS OF VARIANCE

VARIABLE        H          DF       SUMS OF RANKS
   1         16.094        5.00  9729.00 47446.50 65740.50 94201.50 61006.50 35112.00
```

TABLE 103

```
EV TOTAL MARITAL STATUS  K-W

     NO. OF FORMAT CARDS =      1
     NO. OF OBSERVATIONS =    791
     NO. OF INPUT VARIABLES =      1
     TOTAL NO. OF VARIABLES =      1
     SPECIFICATIONS FOR THIS PROBLEM
           NO RANK CORRELATIONS
           KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
           NO COEFFICIENT OF CONCORDANCE
           DATA IS UNRANKED
           DATA INPUT FROM CARDS
     (15X,F1.0)
     NO. OF GROUPS =   5
           GROUP NUMBER          1     2     3     4     5
           NO. IN GROUP        522.   93.  123.   25.   28.

KRUSKAL-WALLIS ANALYSIS OF VARIANCE

VARIABLE         H          DF       SUMS OF RANKS
    1         10.639        4.00207145.50 32409.00 52546.50  9985.50 11149.50
```

TABLE 104

EV FIRST SPEARMAN R (1=SEX,2=AGE,3=WARD TYPE,4=LEVEL OF CARE,5=NSTUDENT

NO. OF FORMAT CARDS = 1
NO. OF OBSERVATIONS = 267
NO. OF INPUT VARIABLES = 5
TOTAL NO. OF VARIABLES = 5
SPECIFICATIONS FOR THIS PROBLEM
SPEARMAN RANK CORRELATIONS
NO TESTS OF SIGNIFICANCE
NO COEFFICIENT OF CONCORDANCE
DATA IS UNRANKED
DATA INPUT FROM CARDS
(8X,2F1.0,2X,F1.0,2X,F1.0,21X,F1.0)

K
KSPEARMAN RHOS (BELOW DIAGONAL) AND T-RATIOS (ABOVE DIAGONAL)

K	1	2	3	4	5
J					
1	1.000000	-1.756271	1.285831	4.398331	-3.663565
2	-0.107265	1.000000	-5.438814	0.816413	0.501306
3	0.078743	-0.316885	1.000000	2.311269	-5.027553
4	0.260835	0.050089	0.140571	1.000000	-2.236723
5	-0.219560	0.030780	-0.295088	-0.136122	1.000000

DEGREES OF FREEDOM = 265

TABLE 105

```
EV FIRST SPEARMAN RHO MEDICAL WARDS ONLY (1=LEVEL OF CARE , 2=NSTUDENT)

          NO. OF FORMAT CARDS =       1
          NO. OF OBSERVATIONS =     131
          NO. OF INPUT VARIABLES =      2
          TOTAL NO. OF VARIABLES =      2
          SPECIFICATIONS FOR THIS PROBLEM
                SPEARMAN RANK CORRELATICNS
                NO TESTS OF SIGNIFICANCE
                NO COEFFICIENT OF CONCORDANCE
                DATA IS UNRANKED
                DATA INPUT FROM CARDS
          (15X,F1.0,T38,F1.0)
K
KSPEARMAN RHOS (BELOW DIAGONAL) AND T-RATIOS (ABOVE DIAGONAL)
K                    1              2
J
   1          1.000000    -1.741910
   2         -0.151594     1.000000
DEGREES OF FREEDOM =    129
```

TABLE 106

```
EV FIRST SPEARMAN RHO SURGCAL WARDS ONLY (1=LEVEL OF CARE , 2=NSTUDENT)

        NO. OF FORMAT CARDS =       1
        NO. OF OBSERVATIONS =     136
        NO. OF INPUT VARIABLES =       2
        TOTAL NO. OF VARIABLES =       2
        SPECIFICATIONS FOR THIS PROBLEM
              SPEARMAN RANK CORRELATIONS
              NO TESTS OF SIGNIFICANCE
              NO COEFFICIENT OF CONCORDANCE
              DATA IS UNRANKED
              DATA INPUT FROM CARDS
        (15X,F1.0,T38,F1.0)
K
KSPEARMAN RHOS (BELOW DIAGONAL) AND T-RATIOS (ABOVE DIAGONAL)
K                1             2
J
   1          1.000000    -0.760087
   2         -0.065520     1.000000
DEGREES OF FREEDOM =    134
```

TABLE 107

E/ Second SPEARMAN R (1=SEX,2=AGE,3=WARD TYPE,4=LEVEL OF CARE,5=NSTUDENT

```
    OF FORMAT CARDS =        1
NO. OF OBSERVATIONS =      260
NO. OF INPUT VARIABLES =       5
TOTAL NO. OF VARIABLES =       5
SPECIFICATIONS FOR THIS PROBLEM
     SPEARMAN RANK CORRELATIONS
     NO TESTS OF SIGNIFICANCE
     NO COEFFICIENT OF CONCORDANCE
     DATA IS UNRANKED
     DATA INPUT FROM CARDS
(8X,2F1.0,2X,F1.0,2X,F1.0,11X,F1.0)
```

K
KSPEARMAN RHOS (BELOW DIAGONAL) AND T-RATIOS (ABOVE DIAGONAL)
K
J

	1	2	3	4	5
1	1.000000	-2.434856	0.723340	1.389972	-6.435718
2	-0.149875	1.000000	-5.136111	2.148429	0.827959
3	0.044988	-0.304569	1.000000	1.853897	-6.667356
4	0.086214	0.132575	0.114657	1.000000	-0.608803
5	-0.371927	0.051478	-0.383376	0.037875	1.000000

DEGREES OF FREEDOM = 258

TABLE 108

```
SECOND SPEARMAN RHO MEDICAL WARDS ONLY (1=LEVEL OF CARE , 2=NSTUDENT)

  NO. OF FORMAT CARDS =       1
  NO. OF OBSERVATIONS =     127
  NO. OF INPUT VARIABLES =       2
  TOTAL NO. OF VARIABLES =       2
  SPECIFICATIONS FOR THIS PROBLEM
       SPEARMAN RANK CORRELATIONS
       NO TESTS OF SIGNIFICANCE
       NO COEFFICIENT OF CONCORDANCE
       DATA IS UNRANKED
       DATA INPUT FROM CARDS
  (15X,F1.0,T38,F1.0)
K
KSPEARMAN RHOS (BELOW DIAGONAL) AND T-RATIOS (ABOVE DIAGONAL)
K                1              2
J
   1         1.000000       0.116097
   2         0.010383       1.000000
DEGREES OF FREEDOM =    125
```

TABLE 109

EV THIRD SPEARMAN R (1=SEX,2=AGE,3=WARD TYPE,4=LEVEL OF CARE,)

```
NO. OF FORMAT CARDS =      1
NO. OF OBSERVATIONS =    264
NO. OF INPUT VARIABLES =     4
TOTAL NO. OF VARIABLES =     4
SPECIFICATIONS FOR THIS PROBLEM
     SPEARMAN RANK CORRELATIONS
     NO TESTS OF SIGNIFICANCE
     NO COEFFICIENT OF CONCORDANCE
     DATA IS UNRANKED
     DATA INPUT FROM CARDS
(8X,2F1.0,2X,F1.0,2X,F1.0,21X,F1.0)
```

K
KSPEARMAN RHOS (BELOW DIAGONAL) AND T-RATIOS (ABOVE DIAGONAL)

K / J	1	2	3	4
1	~~1.000000~~	-3.192876	-0.248150	1.437936
2	-0.193528	~~1.000000~~	-3.903569	2.069368
3	-0.015329	-0.234442	~~1.000000~~	3.448195
4	0.088488	0.126814	0.208355	~~1.000000~~

DEGREES OF FREEDOM = 262

TABLE 110

EV TOTAL SPEARMAN R (1=SEX,2=AGE,3=WARD TYPE,4=LEVEL OF CARE,5=NSTUDENT

```
NO. OF FORMAT CARDS =      1
NO. OF OBSERVATIONS =    791
NO. OF INPUT VARIABLES =      5
TOTAL NO. OF VARIABLES =      5
SPECIFICATIONS FOR THIS PROBLEM
     SPEARMAN RANK CORRELATIONS
     NO TESTS OF SIGNIFICANCE
     NO COEFFICIENT OF CONCORDANCE
     DATA IS UNRANKED
     DATA INPUT FROM CARDS
(8X,2F1.0,2X,F1.0,2X,F1.0,21X,F1.0)
```

K

KSPEARMAN RHOS (BELOW DIAGONAL) AND T-RATIOS (ABOVE DIAGONAL)

K J	1	2	3	4	5
1	1.000000	-4.286606	1.020943	4.141949	-5.312628
2	-0.150861	1.000000	-8.329672	2.725608	0.159078
3	0.036323	-0.284307	1.000000	4.382341	-5.873584
4	0.145880	0.096581	0.154151	1.000000	0.802210
5	-0.185840	0.005663	-0.204678	0.028548	1.000000

DEGREES OF FREEDOM =   789

TABLE 111

```
EV TOTAL MEDICAL WARDS ONLY  SPEARMAN RHO  1=LEVEL 2=NSTUDENTS
     NO. OF FORMAT CARDS =       1
     NO.. OF OBSERVATIONS =    389
     NO. OF INPUT VARIABLES =      2
     TOTAL NO. OF VARIABLES =      2
     SPECIFICATIONS FOR THIS PROBLEM
          SPEARMAN RANK CORRELATIONS
          NO TESTS OF SIGNIFICANCE
          NO COEFFICIENT OF CONCORDANCE
          DATA IS UNRANKED
          DATA INPUT FROM CARDS
(15x,f1.0,21x,f1.0)
          (15X.F1.0.22X.F1.0)
K
KSPEARMAN RHOS (BELOW DIAGONAL) AND T-RATIOS (ABOVE DIAGONAL)
K                  1             2
J
   1         1.000000     -1.524841
   2        -0.077280      1.000000
DEGREES OF FREEDOM =    387
```

TABLE 112

```
EV TOTAL SPEARMAN RHO SURGCAL WARDS ONLY (1=LEVEL OF CARE , 2=NSTUDENT)

     NO. OF FORMAT CARDS =      1
     NO. OF OBSERVATIONS =    402
     NO. OF INPUT VARIABLES =     2
     TOTAL NO. OF VARIABLES =     2
     SPECIFICATIONS FOR THIS PROBLEM
          SPEARMAN RANK CORRELATIONS
          NO TESTS OF SIGNIFICANCE
          NO COEFFICIENT OF CONCORDANCE
          DATA IS UNRANKED
          DATA INPUT FROM CARDS
     (15X,F1.0,T38,F1.0)
K
KSPEARMAN RHOS (BELOW DIAGONAL) AND T-RATIOS (ABOVE DIAGONAL)
K                   1            2
J
   1          1.000000     0.952788
   2          0.047585     1.000000
DEGREES OF FREEDOM =   400
```

APPENDIX C

Interval Tests

T-Test

Anova-F-Test

Pearson r

Data Collection Periods

First

Second

Third

Total Data-Producing Sample

Tables 113 to 156

TABLE 113

EV FIRST SEX(1=F,2=M) T-TEST

NO. OF FORMAT CARDS = 1
NO. OF VARIABLES = 1
NO. OF OBSERVATIONS IN GROUP 1 = 133
NO. OF OBSERVATIONS IN GROUP 2 = 134
(15X,F1.0)

MEANS-TOTAL

	1
1	2.135

STANDARD DEVIATIONS-TOTAL

	1
1	0.531

CORRELATIONS-TOTAL

	1
1	1.000

T TESTS

VARIABLE	XBAR1	XBAR2	SDEV1	SDEV2	DF	T	P-ONE TAIL	P-TWO TAIL
1	2.28	1.93	0.46	0.55	265.	4.531	0.0000041	0.0000082

F TEST-DIFFERENCES BETWEEN VARIANCES

VARIABLE	VAR1	VAR2	DF1	DF2	F	P-NONDIRECTIONAL
1	0.22	0.31	132.	133.	1.417	0.0484434

WELCH T PRIME APPROXIMATION ON VARIABLES

VARIABLE	D.F.	T PRIME	P-ONE TAIL	P-TWO TAIL
1	257.96	4.57	0.0000	0.0000

TABLE 114

EV FIRST WARD(1=MED,2=SURG) T-TEST

NO. OF FORMAT CARDS = 1
NO. OF VARIABLES = 1
NO. OF OBSERVATIONS IN GROUP 1 = 131
NO. OF OBSERVATIONS IN GROUP 2 = 136
(15X,F1.0)

MEANS-TOTAL

	1
1	2.139

STANDARD DEVIATIONS-TOTAL

	1
1	0.531

CORRELATIONS-TOTAL

	1
1	1.000

T TESTS

VARIABLE	XBAR1	XBAR2	SDEV1	SDEV2	DF	T	P-ONE TAIL	P-TWO TAIL
1	2.06	2.21	0.49	0.5[illegible]	265.	-2.262	0.0128735	0.0257470

F TEST-DIFFERENCES BETWEEN VARIANCES

VARIABLE	VAR1	VAR2	DF1	DF2	F	P-NONDIRECTIONAL
1	0.24	0.31	130.	135.	1.291	0.1433529

WELCH T PRIME APPROXIMATION ON VARIABLES

VARIABLE	D.F.	T PRIME	P-ONE TAIL	P-TWO TAIL
1	262.88	2.26	0.0124	0.0249

TABLE 115

EV FIRST STUDENTS(1=YES,2=NO) T-TEST

NO. OF FORMAT CARDS = 1
NO. OF VARIABLES = 1
NO. OF OBSERVATIONS IN GROUP 1 = 100
NO. OF OBSERVATIONS IN GROUP 2 = 167
(16X,F1.0)

MEANS-TOTAL

	1
1	2.136

STANDARD DEVIATIONS-TOTAL

	1
1	0.531

CORRELATIONS-TOTAL

	1
1	1.000

T TESTS

VARIABLE	XBAR1	XBAR2	SDEV1	SDEV2	DF	T	P-ONE TAIL	P-TWO TAIL
1	2.23	2.08	0.51	0.54	266.	2.282	0.0116350	0.0232700

F TEST-DIFFERENCES BETWEEN VARIANCES

VARIABLE	VAR1	VAR2	DF1	DF2	F	P-NONDIRECTIONAL
1	0.26	0.29	99.	166.	1.118	0.5461093

WELCH T PRIME APPROXIMATION ON VARIABLES

VARIABLE	D.F.	T PRIME	P-ONE TAIL	P-TWO TAIL
1	217.70	2.32	0.0106	0.0213

TABLE 116

EV FIRST MEDICAL WARDS NSTUDENT(1=YES,2=NO) T-TEST

NO. OF FORMAT CARDS = 1
NO. OF VARIABLES = 1
NO. OF OBSERVATIONS IN GROUP 1 = 30
NO. OF OBSERVATIONS IN GROUP 2 = 101
(10X,F1.0)

MEANS-TOTAL

	1
1	2.061

STANDARD DEVIATIONS-TOTAL

	1
1	0.490

CORRELATIONS-TOTAL

	1
1	1.000

T TESTS

VARIABLE	XBAR1	XBAR2	SDEV1	SDEV2	DF	T	P-ONE TAIL	P-TWO TAIL
1	2.20	2.02	0.40	0.51	129.	1.779	0.0391395	0.0782791

F TEST-DIFFERENCES BETWEEN VARIANCES

VARIABLE	VAR1	VAR2	DF1	DF2	F	P-NONDIRECTIONAL
1	0.16	0.26	29.	100.	1.606	0.1452968

WELCH T PRIME APPROXIMATION ON VARIABLES

VARIABLE	D.F.	T PRIME	P-ONE TAIL	P-TWO TAIL
1	59.36	2.03	0.0234	0.0468

TABLE 117

EV FIRST SURGICAL WARDS NSTUDENT(1=NO.2=YES) T-TEST

NO. OF FORMAT CARDS = 1
NO. OF VARIABLES = 1
NO. OF OBSERVATIONS IN GROUP 1 = 66
NO. OF OBSERVATIONS IN GROUP 2 = 70
(15X,F1.0)

MEANS-TOTAL

	1
1	2.206

STANDARD DEVIATIONS-TOTAL

	1
1	0.557

CORRELATIONS-TOTAL

	1
1	1.000

T TESTS

VARIABLE	XBAR1	XBAR2	SDEV1	SDEV2	DF	T	P-ONE TAIL	P-TWO TAIL
1	2.17	2.24	0.57	0.55	134.	-0.793	0.2146605	0.4293211

F TEST-DIFFERENCES BETWEEN VARIANCES

VARIABLE	VAR1	VAR2	DF1	DF2	F	P-NONDIRECTIONAL
1	0.32	0.30	65.	69.	1.076	0.7644974

WELCH T PRIME APPROXIMATION ON VARIABLES

VARIABLE	D.F.	T PRIME	P-ONE TAIL	P-TWO TAIL
1	132.78	0.80	0.2131	0.4262

TABLE 118

EV SECOND SEX(1=M,2=F) T-TEST

NO. OF FORMAT CARDS = 1
NO. OF VARIABLES = 1
NO. OF OBSERVATIONS IN GROUP 1 = 123
NO. OF OBSERVATIONS IN GROUP 2 = 137
(15X,F1.0)

MEANS-TOTAL

	1
1	1.988

STANDARD DEVIATIONS-TOTAL

	1
1	0.500

CORRELATIONS-TOTAL

	1
1	1.000

T TESTS

VARIABLE	XBAR1	XBAR2	SDEV1	SDEV2	DF	T	P-ONE TAIL	P-TWO TAIL
1	1.94	2.03	0.51	0.48	258.	-1.387	0.0833517	0.1667035

F TEST-DIFFERENCES BETWEEN VARIANCES

VARIABLE	VAR1	VAR2	DF1	DF2	F	P-NONDIRECTIONAL
1	0.27	0.23	122.	136.	1.139	0.4597257

WELCH T PRIME APPROXIMATION ON VARIABLES

VARIABLE	D.F.	T PRIME	P-ONE TAIL	P-TWO TAIL
1	250.51	1.39	0.0833	0.1665

TABLE 119

EV SECND WARD(1=MED,2=SUPG) T-TEST

NO. OF FORMAT CARDS = 1
NO. OF VARIABLES = 1
NO. OF OBSERVATIONS IN GROUP 1 = 127
NO. OF OBSERVATIONS IN GROUP 2 = 133
(15X,F1.0)

MEANS-TOTAL

	1
1	1.988

STANDARD DEVIATIONS-TOTAL

	1
1	0.500

CORRELATIONS-TOTAL

	1
1	1.000

T TESTS

VARIABLE	XBAR1	XBAR2	SDEV1	SDEV2	DF	T	P-ONE TAIL	P-TWO TAIL
1	1.93	2.05	0.38	0.59	258.	-1.876	0.0309163	0.0618326

F TEST-DIFFERENCES BETWEEN VARIANCES

VARIABLE	VAR1	VAR2	DF1	DF2	F	P-NONDIRECTIONAL
1	0.14	0.34	126.	132.	2.378	0.0

WELCH T PRIME APPROXIMATION ON VARIABLES

VARIABLE	D.F.	T PRIME	P-ONE TAIL	P-TWO TAIL
1	227.62	1.90	0.0293	0.0586

TABLE 120

EV SECOND STUDENTS (1=NO,2=YES) T-TEST

NO. OF FORMAT CARDS = 1
NO. OF VARIABLES = 1
NO. OF OBSERVATIONS IN GROUP 1 = 32
NO. OF OBSERVATIONS IN GROUP 2 = 228
(15X,F1.0)

MEANS-TOTAL

	1
1	1.988

STANDARD DEVIATIONS-TOTAL

	1
1	0.500

CORRELATIONS-TOTAL

	1
1	1.000

T TESTS

VARIABLE	XBAR1	XBAR2	SDEV1	SDEV2	DF	T	P-ONE TAIL	P-TWO TAIL
1	1.94	2.00	0.43	0.51	258.	-0.614	0.2699766	0.5399532

F TEST-DIFFERENCES BETWEEN VARIANCES

VARIABLE	VAR1	VAR2	DF1	DF2	F	P-NONDIRECTIONAL
1	0.18	0.26	31.	227.	1.409	0.2541683

WELCH T PRIME APPROXIMATION ON VARIABLES

VARIABLE	D.F.	T PRIME	P-ONE TAIL	P-TWO TAIL
1	44.24	0.70	0.2435	0.4870

TABLE 121

EV SECOND MEDICAL WARDS NSTUDENT(1=YES,2=NO) T-TEST

NO. OF FORMAT CARDS = 1
NO. OF VARIABLES = 1
NO. OF OBSERVATIONS IN GROUP 1 = 32
NO. OF OBSERVATIONS IN GROUP 2 = 95
(15X,F1.0)

MEANS-TOTAL

	1
1	1.929

STANDARD DEVIATIONS-TOTAL

	1
1	0.380

CORRELATIONS-TOTAL

	1
1	1.000

T TESTS

VARIABLE	XBAR1	XBAR2	SDEV1	SDEV2	DF	T	P-ONE TAIL	P-TWO TAIL
1	1.94	1.93	0.24	0.42	125.	0.143	0.4433961	0.8867922

F TEST-DIFFERENCES BETWEEN VARIANCES

VARIABLE	VAR1	VAR2	DF1	DF2	F	P-NONDIRECTIONAL
1	0.06	0.17	31.	94.	2.961	0.0012904

WELCH T PRIME APPROXIMATION ON VARIABLES

VARIABLE	D.F.	T PRIME	P-ONE TAIL	P-TWO TAIL
1	93.13	0.18	0.4270	0.8540

TABLE 122

CV THIRD SEX(1=M, 2=F) T-TEST

NO. OF FORMAT CARDS = 1
NO. OF VARIABLES = 1
NO. OF OBSERVATIONS IN GROUP 1 = 129
NO. OF OBSERVATIONS IN GROUP 2 = 135
(15X,F1.0)

MEANS-TOTAL

	1
1	1.966

STANDARD DEVIATIONS-TOTAL

	1
1	0.487

CORRELATIONS-TOTAL

	1
1	1.000

T TESTS

VARIABLE	XBAR1	XBAR2	SDEV1	SDEV2	DF	T	P-ONE TAIL	P-TWO TAIL
1	1.92	2.01	0.52	0.45	262.	-1.416	0.0790790	0.1581579

F TEST-DIFFERENCES BETWEEN VARIANCES

VARIABLE	VAR1	VAR2	DF1	DF2	F	P-NONDIRECTIONAL
1	0.27	0.20	128.	134.	1.366	0.0748917

WELCH T PRIME APPROXIMATION ON VARIABLES

VARIABLE	D.F.	T PRIME	P-ONE TAIL	P-TWO TAIL
1	251.96	1.42	0.0790	0.1580

TABLE 123

EV THIRD WARD(1=MED,2=SURG) T-TEST

NO. OF FORMAT CARDS = 1
NO. OF VARIABLES = 1
NO. OF OBSERVATIONS IN GROUP 1 = 131
NO. OF OBSERVATIONS IN GROUP 2 = 133
(16X,F1.0)

MEANS-TOTAL

	1
1	1.966

STANDARD DEVIATIONS-TOTAL

	1
1	0.487

CORRELATIONS-TOTAL

	1
1	1.000

T TESTS

VARIABLE	XBAR1	XBAR2	SDEV1	SDEV2	DF	T	P-ONE TAIL	P-TWO TAIL
1	1.86	2.07	0.42	0.52	262.	-3.489	0.0002900	0.0005801

F TEST-DIFFERENCES BETWEEN VARIANCES

VARIABLE	VAR1	VAR2	DF1	DF2	F	P-NONDIRECTIONAL
1	0.18	0.27	130.	132.	1.524	0.0163680

WELCH T PRIME APPROXIMATION ON VARIABLES

VARIABLE	D.F.	T PRIME	P-ONE TAIL	P-TWO TAIL
1	262.63	3.50	0.0003	0.0006

TABLE 124

EV TOTAL SEX(1=M,2=F) T-TEST

NO. OF FORMAT CARDS = 1
NO. OF VARIABLES = 1
NO. OF OBSERVATIONS IN GROUP 1 = 386
NO. OF OBSERVATIONS IN GROUP 2 = 405
(15X,F1.0)

MEANS-TOTAL

	1
1	2.030

STANDARD DEVIATIONS-TOTAL

	1
1	0.512

CORRELATIONS-TOTAL

	1
1	1.000

T TESTS

VARIABLE	XBAR1	XBAR2	SDEV1	SDEV2	DF	T	P-ONE TAIL	P-TWO TAIL
1	1.95	2.10	0.63	0.48	789.	-4.169	0.0000170	0.0000340

F TEST-DIFFERENCES BETWEEN VARIANCES

VARIABLE	VAR1	VAR2	DF1	DF2	F	P-NONDIRECTIONAL
1	0.28	0.23	385.	404.	1.223	0.0456479

WELCH T PRIME APPROXIMATION ON VARIABLES

VARIABLE	D.F.	T PRIME	P-ONE TAIL	P-TWO TAIL
1	772.05	4.16	0.0000	0.0000

TABLE 125

EV TOTAL WARD(1=MED,2=SURG) T-TEST

NO. OF FORMAT CARDS = 1
NO. OF VARIABLES = 1
NO. OF OBSERVATIONS IN GROUP 1 = 389
NO. OF OBSERVATIONS IN GROUP 2 = 402
(15X,F1.0)

MEANS-TOTAL

	1
1	2.030

STANDARD DEVIATIONS-TOTAL

	1
1	0.612

CORRELATIONS-TOTAL

	1
1	1.000

T TESTS

VARIABLE	XBAR1	XBAR2	SDEV1	SDEV2	DF	T	P-ONE TAIL	P-TWO TAIL
1	1.95	2.11	0.44	0.56	789.	-4.325	0.0000086	0.0000173

F TEST-DIFFERENCES BETWEEN VARIANCES

VARIABLE	VAR1	VAR2	DF1	DF2	F	P-NONDIRECTIONAL
1	0.20	0.31	388.	401.	1.608	0.0000023

WELCH T PRIME APPROXIMATION ON VARIABLES

VARIABLE	D.F.	T PRIME	P-ONE TAIL	P-TWO TAIL
1	758.35	4.35	0.0000	0.0000

TABLE 126

EV TOTAL STUDENTS (1=NO,2=YES) T-TEST

NO. OF FORMAT CARDS = 1
NO. OF VARIABLES = 1
NO. OF OBSERVATIONS IN GROUP 1 = 199
NO. OF OBSERVATIONS IN GROUP 2 = 592
(15X,F1.0)

MEANS-TOTAL

	1
1	2.030

STANDARD DEVIATIONS-TOTAL

	1
1	0.512

CORRELATIONS-TOTAL

	1
1	1.000

T TESTS

VARIABLE	XBAR1	XBAR2	SDEV1	SDEV2	DF	T	P-ONE TAIL	P-TWO TAIL
1	2.06	2.02	0.52	0.51	789.	0.794	0.2138336	0.4276673

F TEST-DIFFERENCES BETWEEN VARIANCES

VARIABLE	VAR1	VAR2	DF1	DF2	F	P-NONDIRECTIONAL
1	0.27	0.26	198.	591.	1.060	0.6034209

WELCH T PRIME APPROXIMATION ON VARIABLES

VARIABLE	D.F.	T PRIME	P-ONE TAIL	P-TWO TAIL
1	332.35	0.78	0.2170	0.4340

TABLE 127

EV FIRST MEDICAL WARDS ONLY (5-8) F-TEST ANOVA

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 4
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL:
30 30 36 35

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	30.	2.1667	0.1437	0.3791
2	30.	2.2000	0.1655	0.4068
3	36.	1.9444	0.4540	0.6738
4	35.	1.9714	0.1462	0.3824
TOTAL	131.	2.0611	0.2405	0.4905

HOMOGENITY OF VARIANCE TEST CHISQ= 17.2151 PROBABILITY= 0.0006

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.16843262E 01	0.56	3.	2.39	0.071782
ERROR	0.29827148E 02	0.23	127.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3	4
1	1.0000	0.9951	0.3329	0.4566
2	0.9951	1.0000	0.2133	0.3134
3	0.3329	0.2133	1.0000	0.9966
4	0.4566	0.3134	0.9966	1.0000

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NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S		2	1	4	3
	MEANS	2.200	2.167	1.971	1.944
3	1.944	0.256	0.222	0.027	0.0
4	1.971	0.229	0.195	0.0	
1	2.167	0.033	0.0		
2	2.200	0.0			

R= 4 3 2

THE MULTIPLIER IS 0.04499

CONSULT TABLE B4. P648 IN WINER

TABLE 128

EV FIRST SUNGCAL WARDS ONLY (1-4) F-TEST ANOVA

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 4
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL:
34 33 32 37

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	34.	2.3529	0.2353	0.4851
2	33.	2.4242	0.3144	0.5607
3	32.	1.9687	0.3538	0.5948
4	37.	2.0811	0.2432	0.4932
TOTAL	136.	2.2059	0.3106	0.5573

HOMOGENITY OF VARIANCE TEST CHISQ= 1.9131 PROBABILITY= 0.5906

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.46843262E 01	1.56	3.	5.49	0.001390
ERROR	0.37551025E 02	0.28	132.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3	4
1	1.0000	0.9600	0.0399	0.2086
2	0.9600	1.0000	0.0098	0.0701
3	0.0399	0.0098	1.0000	0.8586
4	0.2086	0.0701	0.8586	1.0000

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NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S		2	1	4	3
	MEANS	2.424	2.353	2.081	1.969
3	1.969	0.455	0.384	0.112	0.0
4	2.081	0.343	0.272	0.0	
1	2.353	0.071	0.0		
2	2.424	0.0			

R= 4 3 2

THE MULTIPLIER IS 0.09161

CONSULT TABLE B4, P648 IN WINER

TABLE 129

EV FIRST ACCOM F-TEST (ONE-WAY ANOVA)

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 3
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL:
57 86 124

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	57.	2.1228	0.2575	0.5075
2	86.	2.1744	0.2069	0.5355
3	124.	2.1129	0.2961	0.5441
TOTAL	267.	2.1348	0.2814	0.5305

HOMOGENEITY OF VARIANCE TEST CHISQ= 0.4816 PROBABILITY= 0.7860

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.20263672E 00	0.10	2.	0.36	0.700174
ERROR	0.74943604E 02	0.28	264.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3
1	1.0000	0.8515	0.9933
2	0.8515	1.0000	0.7132
3	0.9933	0.7132	1.0000

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S		2	1	3
	MEANS	2.174	2.123	2.113
3	2.113	0.062	0.010	0.0
1	2.123	0.052	0.0	
2	2.174	0.0		

R. 3 2

THE MULTIPLIER IS 0.05936

CONSULT TABLE B4, P648 IN WINER

TABLE 130

EV FIRST AGE F-TEST (ONE-WAY ANOVA)

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 6
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL:
7 51 58 68 59 24

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	7.	2.2857	0.2381	0.4880
2	51.	2.0784	0.2737	0.5232
3	58.	2.0517	0.3306	0.5750
4	68.	2.2353	0.2722	0.5217
5	59.	2.1017	0.2309	0.4805
6	24.	2.2083	0.3460	0.5882
TOTAL	267.	2.1348	0.2814	0.5305

HOMOGENITY OF VARIANCE TEST CHISQ= 2.4627 PROBABILITY= 0.7821

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.16025391E 01	0.32	5.	1.14	0.340895
ERROR	0.73543701E 02	0.28	261.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3	4	5	6
1	1.0000	0.9671	0.9431	0.9999	0.9798	0.9998
2	0.9671	1.0000	0.9999	0.7693	1.0000	0.9641
3	0.9431	0.9999	1.0000	0.5877	0.9983	0.9151
4	0.9999	0.7693	0.5877	1.0000	0.8484	1.0000
5	0.9798	1.0000	0.9983	0.8484	1.0000	0.9834
6	0.9998	0.9641	0.9151	1.0000	0.9834	1.0000

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S		1	4	6	5	2	3
	MEANS	2.286	2.235	2.208	2.102	2.078	2.052
3	2.052	0.234	0.184	0.157	0.050	0.027	0.0
2	2.078	0.207	0.157	0.130	0.023	0.0	
5	2.102	0.184	0.134	0.107	0.0		
6	2.208	0.077	0.027	0.0			
4	2.235	0.050	0.0				
1	2.286	0.0					

RW 6 5 4 3 2

THE MULTIPLIER IS 0.10901

CONSULT TABLE B4, P648 IN WINER

TABLE 131

EV FIRST MARIT F-TEST (ONE-WAY ANOVA)

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 5
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL:
184 29 37 7 10

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	184.	2.1007	0.2941	0.5423
2	29.	2.0345	0.2480	0.4980
3	37.	2.3514	0.2342	0.4840
4	7.	1.8571	0.1429	0.3780
5	10.	2.3000	0.2333	0.4831
TOTAL	267.	2.1348	0.2814	0.5305

HOMOGENITY OF VARIANCE TEST CHISQ= 2.0997 PROBABILITY= 0.7174

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.29645996E 01	0.74	4.	2.69	0.031638
ERROR	0.72181641E 02	0.28	262.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3	4	5
1	1.0000	0.9733	0.1631	0.0177	0.8678
2	0.9733	1.0000	0.2002	0.9579	0.7535
3	0.1631	0.2092	1.0000	0.2696	0.9993
4	0.8177	0.9579	0.2686	1.0000	0.5702
5	0.8678	0.7535	0.9993	0.5702	1.0000

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NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S		3	5	1	2	4
	MEANS	2.351	2.300	2.109	2.034	1.857
4	1.857	0.494	0.443	0.252	0.177	0.0
2	2.034	0.317	0.266	0.074	0.0	
1	2.109	0.243	0.191	0.0		
5	2.300	0.051	0.0			
3	2.351	0.0				
	R=	5	4	3	2	

THE MULTIPLIER IS 0.13065

CONSULT TABLE B4, P648 IN WINER.

TABLE 132

SECOND MEDICAL WARDS ONLY (5-9) F-TEST ANOVA

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 4
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL
29 31 35 32

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	29.	2.0000	0.1429	0.3780
2	31.	1.9032	0.0903	0.3005
3	35.	1.8867	0.1630	0.4038
4	32.	1.9375	0.1895	0.4353
TOTAL	127.	1.9291	0.1446	0.3802

HOMOGENITY OF VARIANCE TEST CHISQ= 4.2758 PROBABILITY= 0.2332

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.23461914E 00	0.08	3.	0.53	0.662073
ERROR	0.18127686E 02	0.15	123.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3	4
1	1.0000	0.8128	0.7048	0.9394
2	0.8128	1.0000	0.9953	0.9885
3	0.7048	0.9953	1.0000	0.9591
4	0.9394	0.9885	0.9691	1.0000

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S			1	4	2	3
		MEANS	2.000	1.937	1.903	1.866
	3	1.986	0.114	0.052	0.018	0.0
	2	1.903	0.097	0.034	0.0	
	4	1.937	0.063	0.0		
	1	2.000	0.0			
		R.	4	3	2	

THE MULTIPLIER IS 0.06829

CONSULT TABLE B4, P648 IN WINER

TABLE 133

SECOND SURGICAL WARD: ONLY (1-4) F-TEST ANOVA

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 4
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL
33 34 33 33

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	33.	1.9091	0.2727	0.5222
2	34.	2.3235	0.3467	0.5889
3	33.	1.9091	0.2727	0.5222
4	33.	2.0303	0.4055	0.6368
TOTAL	133.	2.0451	0.3498	0.5964

HOMOGENEITY OF VARIANCE TEST CHISQ= 1.8169 PROBABILITY= 0.6114

ANALYSIS OF VARIANCE

SOURCE	SS.	MS	DF	F	P.
GROUPS	0.38664976 01	1.29	3.	3.97	0.009810
ERROR	0.41866470 02.	0.32	129.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3	4
1	1.0000	0.0380	1.0000	0.8619
2	0.0380	1.0000	0.0380	0.2234
3	1.0000	0.0380	1.0000	0.8619
4	0.8619	0.2234	0.8619	1.0000

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

1			2	4	3	1
		MEANS	2.324	2.030	1.909	1.909
	1	1.909	0.414	0.121	0.0	0.0
	3	1.909	0.414	0.121	0.0	
	4	2.030	0.293	0.0		
	2	2.324	0.0			
		R=	4	3	2	

THE MULTIPLIER IS 0.09880

CONSULT TABLE B4, PAGE IN WINER

TABLE 134

SECOND ACCOM F-TEST (ONE-WAY ANOVA)

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 3
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL:
51 82 127

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	51.	2.0196	0.2596	0.5095
2	82.	2.0244	0.2463	0.4963
3	127.	1.9528	0.2517	0.5017
TOTAL	260.	1.9885	0.2499	0.4999

HOMOGENITY OF VARIANCE TEST CHISQ= 0.0427 PROBABILITY= 0.9789

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.31713867E 00	0.16	2.	0.63	0.533148
ERROR	0.64648438E 02	0.25	257.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3
1	1.0000	0.9956	0.7241
2	0.9986	1.0000	0.6072
3	0.7241	0.6022	1.0000

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NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S			2	1	3
		MEANS	2.024	2.020	1.953
	3	1.953	0.072	0.067	0.0
	1	2.020	0.005	0.0	
	2	2.024	0.0		
		R=	3	2	

THE MULTIPLIER IS 0.05768

CONSULT TABLE B4, P648 IN WINER

TABLE 135

SECOND AGE F-TEST (ONE-WAY ANOVA)

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 6
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL:
10 36 74 75 . 36 29

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	10.	2.0000	0.2222	0.4714
2	36.	1.9444	0.1683	0.4102
3	74.	1.8514	0.2927	0.5410
4	75.	2.0933	0.1939	0.4438
5	36.	2.0000	0.3429	0.5866
6	29.	2.1034	0.2389	0.4888
TOTAL	260.	1.9885	0.2499	0.4999

HOMOGENITY OF VARIANCE TEST CHISQ= 7.4454 PROBABILITY= 0.1895

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.26752930E 01	0.64	5.	2.18	0.056706
ERROR	0.67290283E 02	0.25	254.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3	4	5	6
1	1.0000	0.9998	0.9772	0.9974	1.0000	0.9971
2	0.9098	1.0000	0.9791	0.8205	0.9988	0.6939
3	0.9772	0.9791	1.0000	0.1176	0.8229	0.3719
4	0.9974	0.8205	0.1176	1.0000	0.9725	1.0000
5	1.0000	0.9988	0.8229	0.9725	1.0000	0.9827
6	0.9971	0.6939	0.3719	1.0000	0.9827	1.0000

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

			6	4	5	1	2	3
5		MEANS	2.103	2.093	2.000	2.000	1.944	1.851
	3	1.851	0.252	0.242	0.149	0.149	0.093	0.0
	2	1.944	0.159	0.149	0.056	0.056	0.0	
	1	2.000	0.103	0.093	0.0	0.0		
	5	2.000	0.103	0.093	0.0			
	4	2.093	0.010	0.0				
	6	2.103	0.0					
		P=	6	5	4	3	2	

THE MULTIPLIER IS 0.09415

CONSULT TABLE A4, P648 IN WINER

TABLE 136

SECOND-WARIT F-TEST (ONE-WAY ANOVA)

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 5
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL:
168 33 39 10 10

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	168.	1.9881	0.2373	0.5360
2	33.	1.9394	0.1212	0.3482
3	39.	2.0769	0.1781	0.4221
4	10.	2.2000	0.1778	0.4216
5	10.	1.6000	0.2667	0.5164
TOTAL	260.	1.9885	0.2499	0.4999

HOMOGENITY OF VARIANCE TEST CHISQ= 10.5760 PROBABILITY= 0.0324

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.23408203E 01	0.10	4.	2.38	0.051971
ERROR	0.62624756E 02	0.25	255.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3	4	5
1	1.0000	0.9918	0.9069	0.7858	0.2189
2	0.9918	1.0000	0.8479	0.7133	0.4645
3	0.9069	0.8479	1.0000	0.9742	0.1211
4	0.7858	0.7133	0.9742	1.0000	0.1230
5	0.2189	0.4645	0.1211	0.1230	1.0000

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S			4	3	1	2	5
		MEANS	2.200	2.077	1.988	1.939	1.600
	5	1.600	0.600	0.477	0.388	0.339	0.0
	2	1.939	0.261	0.138	0.049	0.0	
	1	1.988	0.212	0.089	0.0		
	3	2.077	0.123	0.0			
	4	2.200	0.0				
		P=	5	4	3	2	

THE MULTIPLIER IS 0.11342

CONSULT TABLE B4, P648 IN WINER

TABLE 137

THIRD MEDICAL WARDS ONLY (5-8) F-TEST ANOVA

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 4
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL?
32 31 33 35

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	32.	1.9062	0.1522	0.3902
2	31.	1.9355	0.1290	0.3592
3	33.	1.7273	0.3295	0.5741
4	35.	1.8857	0.1042	0.3228
TOTAL	131.	1.8626	0.1796	0.4238

HOMOGENITY OF VARIANCE TEST CHISQ= 13.2273 PROBABILITY= 0.0042

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.84863281E 00	0.28	3.	1.58	0.196463
ERROR	0.22678223E 02	0.18	127.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3	4
1	1.0000	0.9946	0.4085	0.9979
2	0.9946	1.0000	0.2796	0.9728
3	0.4085	0.2796	1.0000	0.4983
4	0.9979	0.9728	0.4983	1.0000

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S		2	1	4	3
	MEANS	1.935	1.906	1.886	1.727
3	1.727	0.208	0.179	0.158	0.0
4	1.886	0.050	0.021	0.0	
1	1.906	0.029	0.0		
2	1.935	0.0			
	A=	4	3	2	

THE MULTIPLIER IS 0.07391

CONSULT TABLE B4, P648 IN WINER

TABLE 138

THIRDSURGICAL WARDS ONLY (1-4) F-TEST ANOVA

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 4
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL:
33 31 33 36

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	33.	2.0303	0.1553	0.3941
2	31.	2.2581	0.2645	0.5143
3	33.	2.0303	0.3428	0.5855
4	36.	1.9722	0.3135	0.5599
TOTAL	133.	2.0677	0.2736	0.5231

HOMOGENITY OF VARIANCE TEST CHISQ= 5.4588 PROBABILITY= 0.1423

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.15437012E 01	0.51	3.	1.90	0.132028
ERROR	0.34847412E 02	0.27	129.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3	4
1	1.0000	0.3847	1.0000	0.9750
2	0.3847	1.0000	0.3847	0.1747
3	1.0000	0.3847	1.0000	0.9750
4	0.9750	0.1747	0.9750	1.0000

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S		2	3	1	4
	MEANS	2.258	2.030	2.030	1.972
4	1.972	0.286	0.058	0.058	0.0
1	2.030	0.228	0.0	0.0	
3	2.030	0.228	0.0		
2	2.258	0.0			
	R=	4	3	2	

THE MULTIPLIER IS 0.09026

CONSULT TABLE B4, P648 IN WINER

TABLE 139

THIRD ACCOM F-TEST (ONE-WAY ANOVA)

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 3
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL.
51 90 123

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	51.	2.0392	0.2784	0.5277
2	90.	1.9778	0.2018	0.4492
3	123.	1.9268	0.2487	0.4987
TOTAL	264.	1.9659	0.2375	0.4873

HOMOGENITY OF VARIANCE TEST CHISQ= 1.9076 PROBABILITY= 0.3853

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.47460938E 00	0.24	2.	1.00	0.370939
ERROR	0.62218750E 02	0.24	261.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3
1	1.0000	0.7730	0.3861
2	0.7730	1.0000	0.7538
3	0.3861	0.7538	1.0000

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S			1	2	3
		MEANS	2.039	1.978	1.927
	3	1.927	0.112	0.051	0.0
	2	1.978	0.061	0.0	
	1	2.039	0.0		
		R=	3	2	

THE MULTIPLIER IS 0.05556

CONSULT TABLE B4, P648 IN WINER

TABLE 140

THIRD AGE F-TEST (ONE-WAY ANOVA)

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 6
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL:
10 37 50 79 57 31

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	10.	1.6000	0.2667	0.5164
2	37.	1.9189	0.2432	0.4932
3	50.	1.9000	0.2143	0.4629
4	79.	2.0253	0.3070	0.5541
5	57.	2.0175	0.2318	0.4815
6	31.	2.0000	0.0667	0.2582
TOTAL	264.	1.9659	0.2375	0.4873

HOMOGENEITY OF VARIANCE TEST CHISQ= 19.3825 PROBABILITY= 0.0016

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.21042460E 01	0.42	5.	1.79	0.114818
ERROR	0.60549111E 02	0.23	258.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3	4	5	6
1	1.0000	0.6375	0.6703	0.2369	0.2803	0.4002
2	0.6375	1.0000	1.0000	0.9431	0.9678	0.9930
3	0.6703	1.0000	1.0000	0.8419	0.9047	0.9759
4	0.2369	0.9431	0.8419	1.0000	1.0000	1.0000
5	0.2803	0.9678	0.9047	1.0000	1.0000	1.0000
6	0.4002	0.9930	0.9759	1.0000	1.0000	1.0000

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S		MEANS	4	5	6	2	3	1
			2.025	2.018	2.000	1.919	1.900	1.600
	1	1.600	0.425	0.418	0.400	0.319	0.300	0.0
	3	1.900	0.125	0.118	0.100	0.019	0.0	
	2	1.919	0.106	0.099	0.081	0.0		
	6	2.000	0.025	0.018	0.0			
	5	2.018	0.008	0.0				
	4	2.025	0.0					
		R=	6	5	4	3	2	

THE MULTIPLIER IS 0.09055

CONSULT TABLE 04, P648 IN WINER

TABLE 141

THIRD MARIT F-TEST (ONE-WAY ANOVA)

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 5
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL:
170 31 47 8 8

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	170.	2.9941	0.2307	0.4804
2	31.	1.7097	0.2796	0.5287
3	47.	1.9787	0.1517	0.3895
4	8.	2.0000	0.5714	0.7559
5	8.	2.2500	0.2143	0.4629
TOTAL	264.	1.9659	0.2375	0.4873

HOMOGENITY OF VARIANCE TEST CHISQ= 7.7022 PROBABILITY= 0.0952

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.28332520E 01	0.71	4.	3.06	0.017180
ERROR	0.59860107E 02	0.23	259.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3	4	5
1	1.0000	0.0598	0.9998	1.0000	0.7056
2	0.0598	1.0000	0.2140	0.6775	0.0938
3	0.9998	0.2140	1.0000	1.0000	0.7034
4	1.0000	0.6775	1.0000	1.0000	0.8968
5	0.7056	0.0938	0.7034	0.8968	1.0000

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S			5	4	1	3	2
		MEANS	2.250	2.000	1.994	1.979	1.710
	2	1.710	0.540	0.290	0.284	0.269	0.0
	3	1.979	0.271	0.021	0.015	0.0	
	1	1.994	0.256	0.006	0.0		
	4	2.000	0.250	0.0			
	5	2.250	0.0				
		R=	5	4	3	2	

THE MULTIPLIER IS 0.11959

CONSULT TABLE B4, P648 IN WINER

TABLE 142

EV TOTAL SAMPLE F-TEST ONE-WAY ANOVA

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 3
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL:
267 260 264

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	267.	2.1348	0.2825	0.5315
2	260.	1.9885	0.2508	0.5008
3	264.	1.9659	0.2384	0.4882
TOTAL	791.	2.0303	0.2620	0.5119

HOMOGENITY OF VARIANCE TEST CHISQ= 2.0256 PROBABILITY= 0.3652

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.44667969E 01	2.23	2.	8.68	0.000170
ERROR	0.20280518E 03	0.26	788.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3
1	1.0000	0.0043	0.0007
2	0.0043	1.0000	0.8786
3	0.0007	0.8786	1.0000

****

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

			1	2	3
3		MEANS	2.135	1.988	1.966
	3	1.966	0.169	0.023	0.0
	2	1.988	0.146	0.0	
	1	2.135	0.0		

R= 3 2

THE MULTIPLIER IS 0.03124

CONSULT TABLE B4, P648 IN WINER

TABLE 143

EV TOTAL MEDICAL WARDS ONLY (5-8) F-TEST ANOVA

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 4
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL:
91 92 104 102

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	91.	2.0220	0.1551	0.3939
2	92.	2.0109	0.1427	0.3778
3	104.	1.8558	0.3185	0.5646
4	102.	1.9314	0.1435	0.3792
TOTAL	389.	1.9512	0.1956	0.4422

HOMOGENITY OF VARIANCE TEST CHISQ= 25.0746 PROBABILITY= 0.0000

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.17702637E 01	0.59	3.	3.06	0.028289
ERROR	0.74301758E 02	0.19	385.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3	4
1	1.0000	0.9987	0.0754	0.5635
2	0.9987	1.0000	0.1094	0.6633
3	0.0754	0.1094	1.0000	0.6767
4	0.5635	0.6633	0.6767	1.0000

****

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S		1	2	4	3
	MEANS	2.022	2.011	1.931	1.856
3	1.856	0.166	0.155	0.076	0.0
4	1.931	0.091	0.079	0.0	
2	2.011	0.011	0.0		
1	2.022	0.0			
	R=	4	3	2	

THE MULTIPLIER IS 0.04463

CONSULT TABLE B4, P648 IN WINER

TABLE 144

EV TOTAL SURGCAL WARDS ONLY (1-4) F-TEST ANOVA

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 4
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL:
100 98 98 106

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	100.	2.1000	0.2525	0.5025
2	98.	2.3367	0.3081	0.5551
3	98.	1.9694	0.3186	0.5645
4	106.	2.0283	0.3135	0.5599
TOTAL	402.	2.1070	0.3144	0.5607

HOMOGENITY OF VARIANCE TEST CHISQ= 1.6916 PROBABILITY= 0.6388

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.76892090E 01	2.56	3.	8.50	0.000023
ERROR	0.11871143E 03	0.30	398.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3	4
1	1.0000	0.0267	0.4195	0.8286
2	0.0267	1.0000	0.0001	0.0012
3	0.4195	0.0001	1.0000	0.8980
4	0.8286	0.0012	0.8980	1.0000

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S			2	1	4	3
		MEANS	2.337	2.100	2.028	1.969
	3	1.969	0.367	0.131	0.059	0.0
	4	2.028	0.308	0.072	0.0	
	1	2.100	0.237	0.0		
	2	2.337	0.0			
		R=	4	3	2	

THE MULTIPLIER IS 0.05451

CONSULT TABLE B4, P648 IN WINER

TABLE 145

EV TOTAL ACCOM F-TEST (ONE-WAY ANOVA)

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 3
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL:
159 258 374

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	159.	2.0629	0.2618	0.5117
2	258.	2.0581	0.2495	0.4995
3	374.	1.9973	0.2708	0.5204
TOTAL	791.	2.0303	0.2620	0.5119

HOMOGENITY OF VARIANCE TEST CHISQ= 0.5034 PROBABILITY= 0.7775

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.77539063E 00	0.39	2.	1.48	0.228362
ERROR	0.20642658E 03	0.26	788.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3
1	1.0000	0.9958	0.4008
2	0.9958	1.0000	0.3410
3	0.4008	0.3410	1.0000

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S			1	2	3
		MEANS	2.063	2.058	1.997
	3	1.997	0.066	0.061	0.0
	2	2.058	0.005	0.0	
	1	2.063	0.0		
		R=	3	2	

THE MULTIPLIER IS 0.03349

CONSULT TABLE 84, P648 IN WINER

TABLE 146

EV TOTAL AGE F-TEST (ONE-WAY ANOVA)

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 6
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL:
27 124 182 222 152 84

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	27.	1.9259	0.3020	0.5495
2	124.	1.9919	0.2357	0.4855
3	182.	1.9286	0.2877	0.5364
4	222.	2.1126	0.2633	0.5131
5	152.	2.0461	0.2561	0.5061
6	84.	2.0952	0.2077	0.4557
TOTAL	791.	2.0303	0.2620	0.5119

HOMOGENITY OF VARIANCE TEST CHISQ= 3.7877 PROBABILITY= 0.5804

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.42556152E 01	0.85	5.	3.29	0.006016
ERROR	0.20301636E 03	0.26	785.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3	4	5	6
1	1.0000	0.9960	1.0000	0.6624	0.9370	0.8112
2	0.9960	1.0000	0.9499	0.4830	0.9787	0.8396
3	1.0000	0.9499	1.0000	0.0233	0.4911	0.2909
4	0.6624	0.4830	0.0233	1.0000	0.9076	0.9999
5	0.9370	0.9787	0.4911	0.9076	1.0000	0.9917
6	0.8112	0.8396	0.2909	0.9999	0.9917	1.0000

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S			4	6	5	2	3	1
		MEANS	2.113	2.095	2.046	1.992	1.929	1.926
	1	1.926	0.187	0.169	0.120	0.066	0.003	0.0
	3	1.929	0.184	0.167	0.117	0.063	0.0	
	2	1.992	0.121	0.103	0.054	0.0		
	5	2.046	0.067	0.049	0.0			
	6	2.095	0.017	0.0				
	4	2.113	0.0					
		R=	6	5	4	3	2	

THE MULTIPLIER IS 0.05632

CONSULT TABLE B4, P649 IN WINER

TABLE 147

EV TOTAL MARIT F-TEST (ONE-WAY ANOVA)

NUMBER OF VARIABLES = 1
NUMBER OF GROUPS = 6
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL:
522 93 123 25 28

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	522.	2.0826	0.2734	0.5229
2	93.	1.8925	0.2274	0.4769
3	123.	2.1220	0.2063	0.4542
4	25.	2.0400	0.2900	0.5385
5	28.	2.0357	0.3320	0.5762
TOTAL	791.	2.0303	0.2620	0.5119

HOMOGENITY OF VARIANCE TEST CHISQ= 5.4611 PROBABILITY= 0.2482

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.28051756E 01	0.70	4.	2.70	0.029815
ERROR	0.20446680E 03	0.26	786.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3	4	5
1	1.0000	0.2036	0.5486	1.0000	1.0000
2	0.2036	1.0000	0.0307	0.7999	0.7911
3	0.5486	0.0307	1.0000	0.9698	0.9570
4	1.0000	0.7999	0.9698	1.0000	1.0000
5	1.0000	0.7911	0.9570	1.0000	1.0000

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S			3	4	5	1	2
		MEANS	2.122	2.040	2.036	2.033	1.892
	2	1.892	0.229	0.148	0.143	0.140	0.0
	1	2.033	0.089	0.007	0.003	0.0	
	5	2.036	0.086	0.004	0.0		
	4	2.040	0.082	0.0			
	3	2.122	0.0				
		R=	5	4	3	2	

THE MULTIPLIER IS 0.07086

CONSULT TABLE B4. P648 IN WINER

TABLE 148

EV FIRST PEARSON R (1=SEX,2=AGE,3=WARD TYPE,4=LEVEL OF CARE,5=NSTUDENT

NO. OF INDIVIDUALS = 267

NO. OF VARIABLES INPUT = 5

NO. OF VARIABLES GENERATED = 0

TOTAL NO. OF VARIABLES = 5

NFMT = 1 IDKR20 = 0 IPRB = 1

INPUT FORMAT CARD(S)

(8X,2F1.0,2X,F1.0,2X,F1.0,21X,F1.0)

MEANS

	1	2	3	4	5
1	1.498127	3.722846	1.509363	2.134831	1.026467

STANDARD DEVIATIONS

	1	2	3	4	5
1	0.500937	1.314309	0.500852	0.531511	0.484914

CORRELATIONS

	1	2	3	4	5
1	1.000000	-0.097492	0.078443	0.268221	-0.218738
2	-0.097492	1.000000	-0.308985	0.048134	0.025185
3	0.078443	-0.308985	1.000000	0.135950	-0.293975
4	0.268221	0.048134	0.135950	1.000000	-0.136287
5	-0.218738	0.025185	-0.293975	-0.138287	1.000000

T-VALUES ASSOCIATED WITH R'S

	1	2	3	4	5
1	0.0	-1.594641	1.280906	4.532403	-3.649170
2	-1.594641	0.0	-5.288697	0.784466	0.410118
3	1.280906	-5.288697	0.0	2.233840	-5.006805
4	4.532403	0.784466	2.233840	0.0	$\boxed{-2.272764}$
6	-3.649170	0.410718	-5.006805	-2.272984	0.0

PROBABILITIES OF T'S

	1	2	3	4	6
1	0.0	0.111978	0.201339	0.000009	0.000317
2	0.111978	0.0	0.000000	0.433552	0.682185
3	0.201339	0.000000	0.0	0.026317	0.000002
4	0.000009	0.433552	0.026317	0.0	0.023822
6	0.000317	0.682185	0.000001	0.023822	0.0

TABLE 149

EV FIRST MEDICAL WARDS ONLY (1=LEVEL OF CARE , 2=NSTUDENT) PEARSON R

NO. OF INDIVIDUALS = 131

NO. OF VARIABLES INPUT = 2

NO. OF VARIABLES GENERATED = 0

TOTAL NO. OF VARIABLES = 2

NFMT = 1 IOKR20 = 0 IPHB = 1

INPUT FORMAT CARD(S)

(15X,F1.0,T38,F1.0)

MEANS

	1	2
1	2.061069	1.770992

STANDARD DEVIATIONS

	1	2
1	0.492338	0.421807

CORRELATIONS

	1	2
1	1.000000	-0.153201
2	-0.153201	1.000000

T-VALUES ASSOCIATED WITH R'S

	1	2
1	0.0	-1.760817
2	-1.760817	0.0

PROBABILITIES OF T'S

	1	2
1	0.0	[illegible]
	0.080604	0.0

TABLE 150

EV FIRST PEARSON R SURGICAL WARDS ONLY (1=LEVEL OF CARE , 2=NSTUDENT)

NO. OF INDIVIDUALS = 136

NO. OF VARIABLES INPUT = 2

NO. OF VARIABLES GENERATED = 0

TOTAL NO. OF VARIABLES = 2

NFMT = 1 IOKH20 = 0 IPAH = 1

INPUT FORMAT CARD(S)

(15X,F1.0,T30,F1.0)

MEANS

	1	2
1	2.205882	1.485293

STANDARD DEVIATIONS

	1	2
1	0.559334	0.501634

CORRELATIONS

	1	2
1	1.000000	-0.067819
2	-0.067819	1.000000

T-VALUES ASSOCIATED WITH R'S

	1	2
1	0.0	-0.786870
2	-0.786870	0.0

PROBABILITIES OF T'S

	1	2
1	0.0	0.432810
2	0.432810	0.0

TABLE 151

EV SECOND PEARSON R (1=SEX,2=AGE,3=WARD TYPE,4=LEVEL OF CARE,5=NSTUDENT

NO. OF INDIVIDUALS = 260

NO. OF VARIABLES INPUT = 5

NO. OF VARIABLES GENERATED = 0

TOTAL NO. OF VARIABLES = 5

NFMT = 1 IOKR20 = 0 IPRR = 1

INPUT FORMAT CARD(S)

(8X,2F1.0,2X,F1.0,2X,F1.0,21X,F1.0)

MEANS

	1	2	3	4	5
1	1.526922	3.684615	1.511538	1.988461	1.123076

STANDARD DEVIATIONS

	1	2	3	4	5
1	0.500239	1.294685	0.500833	0.500831	0.329161

CORRELATIONS

	1	2	3	4	5
1	1.000000	-0.141289	0.044826	0.085681	-0.370484
2	-0.141289	1.000000	-0.302823	0.118953	0.054988
3	0.044826	-0.302823	1.000000	0.115540	-0.381893
4	0.085681	0.118953	0.115540	1.000000	-0.038036
5	-0.370484	0.054988	-0.381893	-0.038036	1.000000

T-VALUES ASSOCIATED WITH R'S

	1	2	3	4	5
1	0.0	-2.292427	0.720730	1.381327	-6.406771
2	-2.292427	0.0	-5.103693	1.924326	0.884576
3	0.720730	-5.103693	0.0	1.868356	-6.637151
4	1.381327	1.924326	1.868356	0.0	-0.611393
5	-6.406771	0.884576	-6.637151	-0.611393	0.0

PROBABILITIES OF T'S

	1	2	3	4	5
1	0.0	0.022679	0.471832	0.168349	0.000000
2	0.022679	0.0	0.000001	0.055379	0.377228
3	0.471832	0.000001	0.0	0.062801	0.000000
4	0.168349	0.055379	0.062801	0.0	0.541431
5	0.000000	0.377228	0.000000	0.541431	0.0

TABLE 152

SECOND MEDICAL WARDS ONLY (1=LEVEL OF CARE , 2=STUDENT) PEARSON R

NO. OF INDIVIDUALS = 127
NO. OF VARIABLES INPUT = 2
NO. OF VARIABLES GENERATED = 0
TOTAL NO. OF VARIABLES = 2
NFMT = 1 IOXP20 = 0 IPRK = 1
INPUT FORMAT CARD(S)
(15X,F1.0,T38,F1.0)

MEANS

	1	2
1	1.929133	1.251968

STANDARD DEVIATIONS

	1	2
1	0.381750	0.435863

CORRELATIONS

	1	2
1	1.000000	0.012672
2	0.012672	1.000000

T-VALUES ASSOCIATED WITH R'S

	1	2
1	0.0	0.141694
2	0.141694	0.0

PROBABILITIES OF T'S

	1	2
1	0.0	0.887667
2	0.887667	0.0

TABLE 153

EV THIRD PEARSON R (1=SEX,2=AGE,3=WARD TYPE,4=LEVEL OF CARE)

NO. OF INDIVIDUALS = 264

NO. OF VARIABLES INPUT = 4

NO. OF VARIABLES GENERATED = 0

TOTAL NO. OF VARIABLES = 4

NFMT = 1 IDKR20 = 0 IPAB = 1

INPUT FORMAT CARD(S)

(8X,2F1.0,2X,F1.0,2X,F1.0,21X,F1.0)

MEANS

	1	2	3	4
1	1.611363	3.867424	1.503787	1.965909

STANDARD DEVIATIONS

	1	2	3	4
1	0.500822	1.328764	0.500937	0.488239

CORRELATIONS

	1	2	3	4
1	1.000000	-0.194106	-0.015262	0.086791
2	-0.194106	1.000000	-0.229713	0.133162
3	-0.015262	-0.229713	1.000000	0.209614
4	0.086791	0.133162	0.209614	1.000000

T-VALUES ASSOCIATED WITH R'S

	1	2	3	4
1	~~0.0~~	-3.202790	-0.247070	1.410150
2	-3.202790	~~0.0~~	-3.820398	2.174784
3	-0.247070	-3.820398	~~0.0~~	3.469977
4	1.410150	2.174784	3.469977	~~0.0~~

PROBABILITIES OF T'S

	1	2	3	4
1	0.0	0.001630	0.805185	0.159757
2	0.001630	0.0	0.000167	0.030637
3	0.805185	0.000167	0.0	0.000610
4	0.159757	0.030637	0.000610	0.0

TABLE 154

EV TOTAL PEARSON R (1=SEX,2=AGE,3=WARD TYPE,4=LEVEL OF CARE,5=NSTUDENT

NO. OF INDIVIDUALS = 791

NO. OF VARIABLES INPUT = 5

NO. OF VARIABLES GENERATED = 0

TOTAL NO. OF VARIABLES = 5

NFMT = 1 IDKR20 = 0 IPRB = 1

INPUT FORMAT CARD(S)

(8X,2F1.0,2X,F1.0,2X,F1.0,21X,F1.0)

MEANS

	1	2	3	4	5
1	1.612010	3.758533	1.508217	2.030341	1.251580

STANDARD DEVIATIONS

	1	2	3	4	5
1	0.500173	1.313455	0.500250	0.612221	0.434196

CORRELATIONS

	1	2	3	4	5
1	1.000000	-0.144722	0.036247	0.146618	-0.185638
2	-0.144722	1.000000	-0.280777	0.093572	0.004550
3	0.036247	-0.280777	1.000000	0.151981	-0.204498
4	0.146618	0.093572	0.151981	1.000000	0.028207
5	-0.185638	0.004550	-0.204498	0.028207	1.000000

T-VALUES ASSOCIATED WITH R'S

	1	2	3	4	5
1	0.0	-4.108356	1.018818	4.163360	-5.306657
2	-4.108356	0.0	-8.217345	2.639930	0.127812
3	1.018818	-8.217345	0.0	4.319178	-5.868185
4	4.163360	2.639930	4.319178	0.0	0.792616
5	-5.306657	0.127812	-5.868185	0.792616	0.0

PROBABILITIES OF T'S

	1	2	3	4	5
1	0.0	0.000048	0.309120	0.000038	0.000000
2	0.000048	0.0	0.000000	0.008556	0.905011
3	0.309120	0.000000	0.0	0.000020	0.000000
4	0.000038	0.008556	0.000020	0.0	0.429666
5	0.000000	0.905011	0.000000	0.429666	0.0

TABLE 155

EV TOTAL MEDICAL WARDS ONLY (1=LEVEL OF CARE , 2=NSTUDENT) PEARSON R

NO. OF INDIVIDUALS = 389

NO. OF VARIABLES INPUT = 2

NO. OF VARIABLES GENERATED = 0

TOTAL NO. OF VARIABLES = 2

NFMT = 1 IOKR20 = 0 IPRB = 1

INPUT FORMAT CARD(S)

(15X,F1.0,T38,F1.0)

MEANS

	1	2
1	1.951157	1.341902

STANDARD DEVIATIONS

	1	2
1	0.442789	0.474959

CORRELATIONS

	1	2
1	1.000000	0.079411
2	0.079411	1.000000

T-VALUES ASSOCIATED WITH R'S

	1	2
1	0.0	1.567153
2	1.567153	0.0

PROBABILITIES OF T'S

	1	2
1	0.0	0.117830
2	0.117830	0.0

TABLE 156

EV TOTAL PEARSON R SURGICAL WARDS ONLY (1=LEVEL OF CARE , 2=NSTUDENT)

NO. OF INDIVIDUALS = 402
NO. OF VARIABLES INPUT = 2
NO. OF VARIABLES GENERATED = 0
TOTAL NO. OF VARIABLES = 2
NFMT = 1 IDKR20 = 0 IPRB = 1
INPUT FORMAT CARD(S)
(15X,F1.0,T38,F1.0)

MEANS

	1	2
1	2.106965	1.164179

STANDARD DEVIATIONS

	1	2
1	0.561439	0.370899

CORRELATIONS

	1	2
1	1.000000	0.047075
2	0.047075	1.000000

T-VALUES ASSOCIATED WITH R'S

	1	2
1	0.0	0.942549
2	0.942549	0.0

PROBABILITIES OF T'S

	1	2
1	0.0	0.346530
2	0.346530	0.0

APPENDIX D

Nominal Tests

Chi-Square

Fishers Exact Probability

By Sample

By Multivariable Divisions

Sex Controlling For Marital Status

Marital Status Controlling For Sex

Sex Controlling For Marital Status by Age

Age Controlling For Marital Status by Sex

Marital Status Controlling Sex by Age

Tables 157 to 216

TABLE 157

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * *
LEVEL LEVEL OF CARE BY SAMPLE SAMPLE COLLECTION PERIOD
* *

LEVEL	COUNT / ROW PCT / COL PCT / TOT PCT	SAMPLE 1.00	2.00	3.00	ROW TOTAL
I ONE	1.00	22	34	36	92
		23.9	37.0	39.1	11.6
		8.2	13.1	13.6	
		2.8	4.3	4.6	
II TWO	2.00	187	195	201	583
		32.1	33.4	34.5	73.7
		70.0	75.0	76.1	
		23.6	24.7	25.4	
III THREE	3.00	58	31	27	116
		50.0	26.7	23.3	14.7
		21.7	11.9	10.2	
		7.3	3.9	3.4	
	COLUMN TOTAL	267	260	264	791
		33.8	32.9	33.4	100.0

CHI SQUARE = 18.72595 WITH 4 DEGREES OF FREEDOM

TABLE 158

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * *
WDTYPE TYPE OF WARD BY SAMPLE SAMPLE COLLECTION PERIOD
* *

WDTYPE	SAMPLE: COUNT / ROW PCT / COL PCT / TOT PCT	1.00	2.00	3.00	ROW TOTAL
MEDICAL	1.00	131	127	131	389
		33.7	32.6	33.7	49.2
		49.1	48.8	49.6	
		16.6	16.1	16.6	
SURGICAL	2.00	136	133	133	402
		33.8	33.1	33.1	50.8
		50.9	51.2	50.4	
		17.2	16.8	16.8	
	COLUMN TOTAL	267	260	264	791
		33.8	32.9	33.4	100.0

CHI SQUARE = 0.03360 WITH 2 DEGREES OF FREEDOM

TABLE 159

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
SEX SEX BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
MARITAL MARITAL STATUS VALUE = 1.00 MARRIED

SEX	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	II ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MALE	1.00	44	200	32	276
		15.9	72.5	11.6	52.9
		69.8	52.8	40.0	
		8.4	38.3	6.1	
FEMALE	2.00	19	179	48	246
		7.7	72.8	19.5	47.1
		30.2	47.2	60.0	
		3.6	34.3	9.2	
	COLUMN TOTAL	63	379	80	522
		12.1	72.6	15.3	100.0

CHI SQUARE = 12.60171 WITH 2 DEGREES OF FREEDOM

TABLE 160

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
SEX SEX BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
MARITAL MARITAL STATUS VALUE = 2.00 SINGLE
* *

SEX	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MALE	1.00	12	36	2	50
		24.0	72.0	4.0	53.8
		75.0	50.7	33.3	
		12.9	38.7	2.2	
FEMALE	2.00	4	35	4	43
		9.3	81.4	9.3	46.2
		25.0	49.3	66.7	
		4.3	37.6	4.3	
	COLUMN TOTAL	16	71	6	93
		17.2	76.3	6.5	100.0

CHI SQUARE = 4.17794 WITH 2 DEGREES OF FREEDOM

TABLE 161

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
SEX SEX BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
MARITAL MARITAL STATUS VALUE = 3.00 WIDOWED
* *

SEX	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MALE	1.00	2	31	8	41
		4.9	75.6	19.5	33.3
		33.3	32.3	38.1	
		1.6	25.2	6.5	
FEMALE	2.00	4	65	13	82
		4.9	79.3	15.9	66.7
		66.7	67.7	61.9	
		3.3	52.8	10.6	
	COLUMN TOTAL	6	96	21	123
		4.9	78.0	17.1	100.0

CHI SQUARE = 0.26116 WITH 2 DEGREES OF FREEDOM

TABLE 162

```
FILE   TOTAL     (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * *
   SEX      SEX                                                  BY  LEVEL      LEVEL OF CARE
CONTROLLING FOR..
   MARITAL   MARITAL STATUS                                      VALUE =        4.00  DIVORCED
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                       LEVEL
            COUNT    I
            ROW PCT  II ONE      II TWO     III THRE    ROW
            COL PCT  I                          E       TOTAL
            TOT PCT  I     1.00I      2.00I      3.00I
SEX         ---------I---------I---------I---------I
               1.00  I      3  I      7  I      1  I     11
  MALE               I   27.3  I   63.6  I    9.1  I   44.0
                     I  100.0  I   38.9  I   25.0  I
                     I   12.0  I   28.0  I    4.0  I
                    -I---------I---------I---------I
               2.00  I      0  I     11  I      3  I     14
  FEMALE             I    0.0  I   78.6  I   21.4  I   56.0
                     I    0.0  I   61.1  I   75.0  I
                     I    0.0  I   44.0  I   12.0  I
                    -I---------I---------I---------I
            COLUMN          3        18          4       25
             TOTAL       12.0      72.0       16.0    100.0

CHI SQUARE =     4.59505 WITH   2 DEGREES OF FREEDOM
```

TABLE 163

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * *

SEX SEX BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

MARITAL MARITAL STATUS VALUE = 5.00 SEPARATED

* *

SEX	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MALE	1.00	3	2	3	8
		37.5	25.0	37.5	30.8
		75.0	11.8	60.0	
		11.5	7.7	11.5	
FEMALE	2.00	1	15	2	18
		5.6	83.3	11.1	69.2
		25.0	88.2	40.0	
		3.8	57.7	7.7	
	COLUMN TOTAL	4	17	5	26
		15.4	65.4	19.2	100.0

CHI SQUARE = 6.56152 WITH 2 DEGREES OF FREEDOM

TABLE 164

```
FILE   TOTAL    (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * *
    SEX        SEX                                                  BY  LEVEL     LEVEL OF CARE
CONTROLLING FOR..
    MARITAL   MARITAL STATUS                                        VALUE =       6.00  OTHER
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                     LEVEL
           COUNT  I
          ROW PCT III TWO      ROW
          COL PCT I            TOTAL
          TOT PCT I     2.00I
SEX       --------I---------I
            2.00  I      2  I      2
  FEMALE          I 100.0   I  100.0
                  I 100.0   I
                  I 100.0   I
                 -I---------I
          COLUMN         2         2
           TOTAL     100.0     100.0
```

TABLE 165

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
MARITAL MARITAL STATUS BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
SEX SEX VALUE = 1.00 MALE
* *

MARITAL	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MARRIED	1.00	44	200	32	276
		15.9	72.5	11.6	71.5
		68.8	72.5	69.6	
		11.4	51.8	8.3	
SINGLE	2.00	12	36	2	50
		24.0	72.0	4.0	13.0
		18.8	13.0	4.3	
		3.1	9.3	0.5	
WIDOWED	3.00	2	31	8	41
		4.9	75.6	19.5	10.6
		3.1	11.2	17.4	
		0.5	8.0	2.1	
DIVORCED	4.00	3	7	1	11
		27.3	63.6	9.1	2.8
		4.7	2.5	2.2	
		0.8	1.8	0.3	
SEPARATED	5.00	3	2	3	8
		37.5	25.0	37.5	2.1
		4.7	0.7	6.5	
		0.8	0.5	0.8	
	COLUMN TOTAL	64	276	46	386
		16.6	71.5	11.9	100.0

CHI SQUARE = 15.73912 WITH 8 DEGREES OF FREEDOM

TABLE 166

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
MARITAL MARITAL STATUS BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
SEX SEX VALUE = 2.00 FEMALE
* *

MARITAL	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	II ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MARRIED	1.00	19	179	48	246
		7.7	72.8	19.5	60.7
		67.9	58.3	68.6	
		4.7	44.2	11.9	
SINGLE	2.00	4	35	4	43
		9.3	81.4	9.3	10.6
		14.3	11.4	5.7	
		1.0	8.6	1.0	
WIDOWED	3.00	4	65	13	82
		4.9	79.3	15.9	20.2
		14.3	21.2	18.6	
		1.0	16.0	3.2	
DIVORCED	4.00	0	11	3	14
		0.0	78.6	21.4	3.5
		0.0	3.6	4.3	
		0.0	2.7	0.7	
SEPARATED	5.00	1	15	2	18
		5.6	83.3	11.1	4.4
		3.6	4.9	2.9	
		0.2	3.7	0.5	
OTHER	6.00	0	2	0	2
		0.0	100.0	0.0	0.5
		0.0	0.7	0.0	
		0.0	0.5	0.0	
	COLUMN TOTAL	28	307	70	405
		6.9	75.8	17.3	100.0

CHI SQUARE = 6.41454 WITH 10 DEGREES OF FREEDOM

TABLE 167

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *

SEX SEX BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

MARITAL MARITAL STATUS VALUE = 1.00 MARRIED

BY AGE AGE VALUE = 1.00 UNDER 20 YEARS

* *

SEX	LEVEL COUNT ROW PCT COL PCT TOT PCT	III TWO 2.00	III THREE 3.00	ROW TOTAL
FEMALE	2.00	2 50.0 100.0 50.0	2 50.0 100.0 50.0	4 100.0
	COLUMN TOTAL	2 50.0	2 50.0	4 100.0

TABLE 168

```
FILE    TOTAL     (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * *
    SEX        SEX                                                   BY  LEVEL      LEVEL OF CARE
CONTROLLING FOR..
    MARITAL    MARITAL STATUS                                        VALUE =        2.00  SINGLE
BY  AGE        AGE                                                   VALUE =        1.00  UNDER 20 YEARS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                    LEVEL
            COUNT   I
            ROW PCT II ONE     II TWO     III THRE    ROW
            COL PCT I                      E          TOTAL
            TOT PCT I     1.00I     2.00I     3.00I
SEX         --------I--------I--------I--------I
              1.00  I     2  I     8  I     1  I     11
  MALE              I  18.2  I  72.7  I   9.1  I   50.0
                    I  40.0  I  50.0  I 100.0  I
                    I   9.1  I  36.4  I   4.5  I
                   -I--------I--------I--------I
              2.00  I     3  I     8  I     0  I     11
  FEMALE            I  27.3  I  72.7  I   0.0  I   50.0
                    I  60.0  I  50.0  I   0.0  I
                    I  13.6  I  36.4  I   0.0  I
                   -I--------I--------I--------I
            COLUMN        5       16        1       22
             TOTAL     22.7     72.7      4.5    100.0

CHI SQUARE =      1.20000 WITH   2 DEGREES OF FREEDOM
```

TABLE 169

```
FILE    TOTAL      (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * *
    SEX        SEX                                            BY LEVEL      LEVEL OF CARE
CONTROLLING FOR..
    MARITAL    MARITAL STATUS                                 VALUE =        5.00  SEPARATED
BY  AGE        AGE                                            VALUE =        1.00  UNDER 20 YEARS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                     LEVEL
              COUNT   I
            ROW PCT III TWO       ROW
            COL PCT I             TOTAL
            TOT PCT I      2.00I
SEX         --------I---------I
              2.00  I       1  I      1
  FEMALE            I  100.0   I  100.0
                    I  100.0   I
                    I  100.0   I
                  -I---------I
            COLUMN         1          1
             TOTAL     100.0      100.0
```

TABLE 170

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *

SEX SEX BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

MARITAL MARITAL STATUS VALUE = 1.00 MARRIED

BY AGE AGE VALUE = 2.00 21-35 YEARS

* *

SEX	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: ONE 1.00	TWO 2.00	THREE 3.00	ROW TOTAL
MALE	1.00	5	18	3	26
		19.2	69.2	11.5	29.2
		55.6	25.7	30.0	
		5.6	20.2	3.4	
FEMALE	2.00	4	52	7	63
		6.3	82.5	11.1	70.8
		44.4	74.3	70.0	
		4.5	58.4	7.9	
	COLUMN TOTAL	9	70	10	89
		10.1	78.7	11.2	100.0

CHI SQUARE = 3.43748 WITH 2 DEGREES OF FREEDOM

TABLE 171

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * *

SEX SEX BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

MARITAL MARITAL STATUS VALUE = 2.00 SINGLE

BY AGE AGE VALUE = 2.00 21-35 YEARS

* *

SEX	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MALE	1.00	3	6	0	9
		33.3	66.7	0.0	42.9
		100.0	40.0	0.0	
		14.3	28.6	0.0	
FEMALE	2.00	0	9	3	12
		0.0	75.0	25.0	57.1
		0.0	60.0	100.0	
		0.0	42.9	14.3	
	COLUMN TOTAL	3	15	3	21
		14.3	71.4	14.3	100.0

CHI SQUARE = 6.30000 WITH 2 DEGREES OF FREEDOM

TABLE 172

```
FILE    TOTAL     (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * *
    SEX        SEX                                                      BY  LEVEL      LEVEL OF CARE
CONTROLLING FOR..
    MARITAL    MARITAL STATUS                                           VALUE =        4.00  DIVORCED
BY  AGE        AGE                                                      VALUE =        2.00  21-35 YEARS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                    LEVEL
           COUNT   I
           ROW PCT II ONE     II TWO      ROW
           COL PCT I                      TOTAL
           TOT PCT I     1.00I     2.00I
SEX        --------I---------I---------I
            1.00   I       2 I       1 I      3
  MALE             I   66.7  I   33.3  I   42.9
                   I  100.0  I   20.0  I
                   I   28.6  I   14.3  I
                  -I---------I---------I
            2.00   I       0 I       4 I      4
  FEMALE           I    0.0  I  100.0  I   57.1
                   I    0.0  I   80.0  I
                   I    0.0  I   57.1  I
                  -I---------I---------I
           COLUMN          2         5        7
            TOTAL      28.6      71.4    100.0

FISHER'S EXACT TEST =  0.14286
```

TABLE 173

```
FILE   TOTAL     (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * *
    SEX        SEX                                              BY  LEVEL      LEVEL OF CARE
CONTROLLING FOR..
    MARITAL    MARITAL STATUS                                   VALUE =        5.00  SEPARATED
BY  AGE        AGE                                              VALUE =        2.00  21-35 YEARS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                     LEVEL
              COUNT   I
             ROW PCT II ONE     II TWO    III THRE    ROW
             COL PCT I                      E         TOTAL
             TOT PCT I     1.00I    2.00I    3.00I
SEX          --------I--------I--------I--------I
                1.00 I       1 I       0 I       0 I       1
  MALE               I 100.0  I    0.0  I    0.0  I   20.0
                     I 100.0  I    0.0  I    0.0  I
                     I  20.0  I    0.0  I    0.0  I
                    -I--------I--------I--------I
                2.00 I       0 I       3 I       1 I       4
  FEMALE             I    0.0  I   75.0  I   25.0  I   80.0
                     I    0.0  I  100.0  I  100.0  I
                     I    0.0  I   60.0  I   20.0  I
                    -I--------I--------I--------I
             COLUMN          1         3         1         5
              TOTAL       20.0      60.0      20.0     100.0

CHI SQUARE =      5.00000 WITH   2 DEGREES OF FREEDOM
```

TABLE 174

```
FILE    TOTAL     (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * *
    SEX       SEX                                               BY  LEVEL     LEVEL OF CARE
CONTROLLING FOR..
    MARITAL   MARITAL STATUS                                    VALUE =       6.00  OTHER
BY  AGE       AGE                                               VALUE =       2.00  21-35 YEARS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                        LEVEL
             COUNT   I
           ROW PCT III TWO       ROW
           COL PCT I             TOTAL
           TOT PCT I      2.00I
SEX        --------I---------I
              2.00   I     2   I      2
  FEMALE             I 100.0   I  100.0
                     I 100.0   I
                     I 100.0   I
                    -I---------I
           COLUMN          2          2
            TOTAL      100.0      100.0
```

TABLE 175

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * *

SEX SEX BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

MARITAL MARITAL STATUS VALUE = 1.00 MARRIED

BY AGE AGE VALUE = 3.00 36-50 YEARS

* *

SEX	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MALE	1.00	18	50	4	72
		25.0	69.4	5.6	46.5
		62.1	46.7	21.1	
		11.6	32.3	2.6	
FEMALE	2.00	11	57	15	83
		13.3	68.7	18.1	53.5
		37.9	53.3	78.9	
		7.1	36.8	9.7	
	COLUMN TOTAL	29	107	19	155
		18.7	69.0	12.3	100.0

CHI SQUARE = 7.77453 WITH 2 DEGREES OF FREEDOM

TABLE 176

```
FILE    TOTAL     (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * *
   SEX       SEX                                                   BY  LEVEL      LEVEL OF CARE
CONTROLLING FOR..
   MARITAL   MARITAL STATUS                                        VALUE =        2.00  SINGLE
BY  AGE      AGE                                                   VALUE =        3.00  36-50 YEARS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                       LEVEL
              COUNT   I
              ROW PCT II ONE     II TWO    III THRE    ROW
              COL PCT I                     E          TOTAL
              TOT PCT I     1.00I     2.00I     3.00I
SEX           --------I--------I--------I--------I
                 1.00 I      1 I      5 I      0 I      6
  MALE                I   16.7 I   83.3 I    0.0 I   66.7
                      I  100.0 I   71.4 I    0.0 I
                      I   11.1 I   55.6 I    0.0 I
                     -I--------I--------I--------I
                 2.00 I      0 I      2 I      1 I      3
  FEMALE              I    0.0 I   66.7 I   33.3 I   33.3
                      I    0.0 I   28.6 I  100.0 I
                      I    0.0 I   22.2 I   11.1 I
                     -I--------I--------I--------I
              COLUMN         1        7        1        9
               TOTAL      11.1     77.8     11.1    100.0

CHI SQUARE =     2.57143 WITH   2 DEGREES OF FREEDOM
```

TABLE 177

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *

SEX SEX BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

MARITAL MARITAL STATUS VALUE = 3.00 WIDOWED

BY AGE AGE VALUE = 3.00 36-50 YEARS

* *

SEX	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: II ONE 1.00	II TWO 2.00	ROW TOTAL
MALE	1.00	0	1	1
		0.0	100.0	33.3
		0.0	50.0	
		0.0	33.3	
FEMALE	2.00	1	1	2
		50.0	50.0	66.7
		100.0	50.0	
		33.3	33.3	
	COLUMN TOTAL	1	2	3
		33.3	66.7	100.0

FISHER'S EXACT TEST = 0.66667

TABLE 178

```
FILE   TOTAL     (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * *  C R O S S T A B U L A T I O N   O F  * * * * * * * * *
    SEX        SEX                                              BY  LEVEL     LEVEL OF CARE
CONTROLLING FOR..
    MARITAL    MARITAL STATUS                                   VALUE =       4.00  DIVORCED
BY  AGE        AGE                                              VALUE =       3.00  36-50 YEARS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                     LEVEL
           COUNT   I
           ROW PCT III TWO       ROW
           COL PCT I             TOTAL
           TOT PCT I     2.00I
SEX        --------I---------I
             1.00  I       3  I      3
  MALE             I 100.0   I 100.0
                   I 100.0   I
                   I 100.0   I
                  -I---------I
           COLUMN          3         3
            TOTAL      100.0     100.0
```

TABLE 179

```
FILE    TOTAL     (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * *
    SEX        SEX                                                    BY  LEVEL     LEVEL OF CARE
CONTROLLING FOR..
    MARITAL    MARITAL STATUS                                         VALUE =       5.00  SEPARATED
BY  AGE        AGE                                                    VALUE =       3.00  36-50 YEARS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                        LEVEL
              COUNT   I
              ROW PCT II ONE     II TWO      ROW
              COL PCT I                      TOTAL
              TOT PCT I    1.00I     2.00I
SEX           --------I--------I--------I
                1.00  I      1 I       1 I     2
  MALE                I   50.0 I   50.0  I  16.7
                      I   50.0 I   10.0  I
                      I    8.3 I    8.3  I
                     -I--------I--------I
                2.00  I      1 I       9 I    10
  FEMALE              I   10.0 I   90.0  I  83.3
                      I   50.0 I   90.0  I
                      I    8.3 I   75.0  I
                     -I--------I--------I
              COLUMN         2        10      12
               TOTAL      16.7      83.3   100.0

FISHER'S EXACT TEST =   0.98485
```

TABLE 180

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *

SEX SEX BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

MARITAL MARITAL STATUS VALUE = 1.00 MARRIED

BY AGE AGE VALUE = 4.00 51-65 YEARS

* *

SEX	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MALE	1.00	9	67	15	91
		9.9	73.6	16.5	58.7
		75.0	60.9	45.5	
		5.8	43.2	9.7	
FEMALE	2.00	3	43	18	64
		4.7	67.2	28.1	41.3
		25.0	39.1	54.5	
		1.9	27.7	11.6	
	COLUMN TOTAL	12	110	33	155
		7.7	71.0	21.3	100.0

CHI SQUARE = 3.92496 WITH 2 DEGREES OF FREEDOM

TABLE 181

```
FILE   TOTAL    (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * *  C R O S S T A B U L A T I O N   O F  * * * * * * * *
    SEX        SEX                                              BY  LEVEL     LEVEL OF CARE
CONTROLLING FOR..
    MARITAL    MARITAL STATUS                                   VALUE =        2.00  SINGLE
BY  AGE        AGE                                              VALUE =        4.00  51-65 YEARS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                       LEVEL
           COUNT   I
           ROW PCT II ONE     II TWO      ROW
           COL PCT I                      TOTAL
           TOT PCT I     1.00I     2.00I
SEX        --------I---------I---------I
             1.00  I       3 I      11 I     14
  MALE             I    21.4 I    78.6 I   60.9
                   I    75.0 I    57.9 I
                   I    13.0 I    47.8 I
                  -I---------I---------I
             2.00  I       1 I       8 I      9
  FEMALE           I    11.1 I    88.9 I   39.1
                   I    25.0 I    42.1 I
                   I     4.3 I    34.8 I
                  -I---------I---------I
           COLUMN          4        19       23
            TOTAL       17.4      82.6    100.0

CORRECTED CHI SQUARE =      0.00940     WITH 1 DEGREE OF FREEDOM
```

TABLE 182

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * *
SEX SEX BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
MARITAL MARITAL STATUS VALUE = 3.00 WIDOWED
BY AGE AGE VALUE = 4.00 51-65 YEARS
* *

SEX	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MALE	1.00	0	5	2	7
		0.0	71.4	28.6	25.0
		0.0	22.7	40.0	
		0.0	17.9	7.1	
FEMALE	2.00	1	17	3	21
		4.8	81.0	14.3	75.0
		100.0	77.3	60.0	
		3.6	60.7	10.7	
	COLUMN TOTAL	1	22	5	28
		3.6	78.6	17.9	100.0

CHI SQUARE = 0.99394 WITH 2 DEGREES OF FREEDOM

TABLE 183

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * *
SEX SEX BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
MARITAL MARITAL STATUS VALUE = 4.00 DIVORCED
BY AGE AGE VALUE = 4.00 51-65 YEARS
* *

SEX	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MALE	1.00	1	2	1	4
		25.0	50.0	25.0	33.3
		100.0	25.0	33.3	
		8.3	16.7	8.3	
FEMALE	2.00	0	6	2	8
		0.0	75.0	25.0	66.7
		0.0	75.0	66.7	
		0.0	50.0	16.7	
	COLUMN TOTAL	1	8	3	12
		8.3	66.7	25.0	100.0

CHI SQUARE = 2.25000 WITH 2 DEGREES OF FREEDOM

TABLE 184

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * *
SEX SEX BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
MARITAL MARITAL STATUS VALUE = 5.00 SEPARATED
BY AGE AGE VALUE = 4.00 51-65 YEARS
* *

SEX	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	III TWO 2.00	III THREE 3.00	ROW TOTAL
MALE	1.00	0	2	2
		0.0	100.0	50.0
		0.0	100.0	
		0.0	50.0	
FEMALE	2.00	2	0	2
		100.0	0.0	50.0
		100.0	0.0	
		50.0	0.0	
	COLUMN TOTAL	2	2	4
		50.0	50.0	100.0

FISHER'S EXACT TEST = 0.16667

TABLE 185

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * *

SEX SEX BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

MARITAL MARITAL STATUS VALUE = 1.00 MARRIED

BY AGE AGE VALUE = 5.00 66-80 YEARS

* *

SEX	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MALE	1.00	7	47	6	60
		11.7	78.3	10.0	69.8
		87.5	71.2	50.0	
		8.1	54.7	7.0	
FEMALE	2.00	1	19	6	26
		3.8	73.1	23.1	30.2
		12.5	28.8	50.0	
		1.2	22.1	7.0	
	COLUMN TOTAL	8	66	12	86
		9.3	76.7	14.0	100.0

CHI SQUARE = 3.48101 WITH 2 DEGREES OF FREEDOM

TABLE 186

```
FILE    TOTAL     (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * *
    SEX       SEX                                                  BY  LEVEL     LEVEL OF CARE
CONTROLLING FOR..
    MARITAL   MARITAL STATUS                                       VALUE =       2.00  SINGLE
BY  AGE       AGE                                                  VALUE =       5.00  66-80 YEARS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                     LEVEL
             COUNT  I
            ROW PCT II ONE     II TWO    III THRE   ROW
            COL PCT I                     E         TOTAL
            TOT PCT I     1.00I     2.00I     3.00I
SEX         --------I--------I--------I--------I
              1.00  I      3  I      5  I      1  I      9
  MALE              I   33.3  I   55.6  I   11.1  I   75.0
                    I  100.0  I   62.5  I  100.0  I
                    I   25.0  I   41.7  I    8.3  I
                   -I--------I--------I--------I
              2.00  I      0  I      3  I      0  I      3
  FEMALE            I    0.0  I  100.0  I    0.0  I   25.0
                    I    0.0  I   37.5  I    0.0  I
                    I    0.0  I   25.0  I    0.0  I
                   -I--------I--------I--------I
            COLUMN         3         8         1        12
             TOTAL      25.0      66.7       8.3     100.0

CHI SQUARE =     2.00000 WITH   2 DEGREES OF FREEDOM
```

TABLE 187

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *

SEX SEX BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

MARITAL MARITAL STATUS VALUE = 3.00 WIDOWED

BY AGE AGE VALUE = 5.00 66-80 YEARS

* *

SEX	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	II ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MALE	1.00	2	14	3	19
		10.5	73.7	15.8	39.6
		50.0	37.8	42.9	
		4.2	29.2	6.3	
FEMALE	2.00	2	23	4	29
		6.9	79.3	13.8	60.4
		50.0	62.2	57.1	
		4.2	47.9	8.3	
	COLUMN TOTAL	4	37	7	48
		8.3	77.1	14.6	100.0

CHI SQUARE = 0.26000 WITH 2 DEGREES OF FREEDOM

TABLE 188

```
FILE    TOTAL     (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * *
    SEX       SEX                                                   BY  LEVEL      LEVEL OF CARE
CONTROLLING FOR..
    MARITAL   MARITAL STATUS                                        VALUE =        4.00  DIVORCED
BY  AGE       AGE                                                   VALUE =        5.00  66-80 YEARS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                   LEVEL
            COUNT  I
            ROW PCT III TWO    III THRE    ROW
            COL PCT I           E          TOTAL
            TOT PCT I     2.00I     3.00I
SEX         --------I---------I---------I
             1.00   I       1 I       0 I       1
  MALE              I  100.0  I    0.0  I    33.3
                    I   50.0  I    0.0  I
                    I   33.3  I    0.0  I
                   -I---------I---------I
             2.00   I       1 I       1 I       2
  FEMALE            I   50.0  I   50.0  I    66.7
                    I   50.0  I  100.0  I
                    I   33.3  I   33.3  I
                   -I---------I---------I
            COLUMN          2         1         3
             TOTAL       66.7      33.3     100.0

FISHER'S EXACT TEST =   0.66667
```

TABLE 189

```
FILE   TOTAL    (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * *
    SEX        SEX                                                     BY  LEVEL      LEVEL OF CARE
CONTROLLING FOR..
    MARITAL    MARITAL STATUS                                          VALUE =        5.00  SEPARATED
BY  AGE        AGE                                                     VALUE =        5.00  66-80 YEARS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                    LEVEL
           COUNT   I
           ROW PCT II ONE     III THRE    ROW
           COL PCT I          E           TOTAL
           TOT PCT I    1.00I     3.00I
SEX        --------I--------I--------I
             1.00  I     1  I      1  I     2
  MALE             I  50.0  I   50.0  I  66.7
                   I 100.0  I   50.0  I
                   I  33.3  I   33.3  I
                  -I--------I--------I
             2.00  I     0  I      1  I     1
  FEMALE           I   0.0  I  100.0  I  33.3
                   I   0.0  I   50.0  I
                   I   0.0  I   33.3  I
                  -I--------I--------I
           COLUMN        1         2        3
            TOTAL     33.3      66.7    100.0

FISHER'S EXACT TEST =  0.66667
```

TABLE 190

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * *

SEX SEX BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

MARITAL MARITAL STATUS VALUE = 1.00 MARRIED

BY AGE AGE VALUE = 6.00 OVER 80 YEARS

* *

SEX	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MALE	1.00	5	18	4	27
		18.5	66.7	14.8	81.8
		100.0	75.0	100.0	
		15.2	54.5	12.1	
FEMALE	2.00	0	6	0	6
		0.0	100.0	0.0	18.2
		0.0	25.0	0.0	
		0.0	18.2	0.0	
	COLUMN TOTAL	5	24	4	33
		15.2	72.7	12.1	100.0

CHI SQUARE = 2.75000 WITH 2 DEGREES OF FREEDOM

TABLE 191

```
FILE    TOTAL     (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * *
    SEX        SEX                                                BY  LEVEL      LEVEL OF CARE
CONTROLLING FOR..
    MARITAL    MARITAL STATUS                                     VALUE =        2.00  SINGLE
BY  AGE        AGE                                                VALUE =        6.00  OVER 80 YEARS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                    LEVEL
           COUNT   I
           ROW PCT III TWO       ROW
           COL PCT I             TOTAL
           TOT PCT I      2.00I
SEX        --------I--------I
             1.00  I       1  I       1
  MALE             I  100.0  I    16.7
                   I   16.7  I
                   I   16.7  I
                  -I--------I
             2.00  I       5  I       5
  FEMALE           I  100.0  I    83.3
                   I   83.3  I
                   I   83.3  I
                  -I--------I
           COLUMN         6         6
            TOTAL     100.0     100.0
```

TABLE 192

```
FILE    TOTAL     (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * *
    SEX       SEX                                                 BY  LEVEL      LEVEL OF CARE
CONTROLLING FOR..
    MARITAL   MARITAL STATUS                                      VALUE =        3.00  WIDOWED
BY  AGE       AGE                                                 VALUE =        6.00  OVER 60 YEARS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                     LEVEL
            COUNT   I
            ROW PCT III TWO    III THRE    ROW
            COL PCT I           E          TOTAL
            TOT PCT I     2.00I     3.00I
SEX         --------I--------I--------I
              1.00  I    11   I     3   I    14
  MALE              I   78.6  I   21.4  I   31.8
                    I   31.4  I   33.3  I
                    I   25.0  I    6.8  I
                   -I--------I--------I
              2.00  I    24   I     6   I    30
  FEMALE            I   80.0  I   20.0  I   68.2
                    I   68.6  I   66.7  I
                    I   54.5  I   13.6  I
                   -I--------I--------I
            COLUMN       35         9        44
             TOTAL      79.5      20.5     100.0

CORRECTED CHI SQUARE =      0.08514      WITH 1 DEGREE OF FREEDOM
```

TABLE 193

```
FILE    TCTAL     (CREATICN DATE = C3/18/71)

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * *
     SEX         SEX                                            BY  LEVEL     LEVEL OF CARE
CCNTROLLING FCR..
     MARITAL    MARITAL STATUS                                  VALUE =        5.00  SEPARATED
BY   AGE         AGE                                            VALUE =        6.00  OVER 80 YEARS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                         LEVEL
               CCUNT   I
               RCW PCT III TWO       RCW
               CCL PCT I             TCTAL
               TCT PCT I     2.00I
SEX            --------I--------I
                 1.CC  I       1 I       1
  MALE                 I 100.0  I 100.0
                       I 100.0  I
                       I 100.0  I
                      -I--------I
               CCLUMN          1         1
                TCTAL      100.0     100.0
```

TABLE 194

```
FILE    TOTAL    (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * *
    MARITAL    MARITAL STATUS                                          BY  LEVEL      LEVEL OF CARE
CONTROLLING FOR..
    SEX        SEX                                                     VALUE =        1.00  MALE
BY  AGE        AGE                                                     VALUE =        1.00  UNDER 20 YEARS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                     LEVEL
            COUNT   I
            ROW PCT II ONE     II TWO    III THRE    ROW
            COL PCT I                       E        TOTAL
            TOT PCT I    1.00I     2.00I     3.00I
MARITAL     --------I--------I---------I---------I
             2.00   I      2 I       8 I       1 I     11
  SINGLE            I   18.2 I    72.7 I     9.1 I  100.0
                    I  100.0 I   100.0 I   100.0 I
                    I   18.2 I    72.7 I     9.1 I
                   -I--------I---------I---------I
            COLUMN         2         8         1      11
             TOTAL      18.2      72.7       9.1   100.0
```

TABLE 195

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *
MARITAL MARITAL STATUS . BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
SEX SEX VALUE = 1.00 MALE
BY AGE AGE VALUE = 2.00 21-35 YEARS
* *

MARITAL	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: ONE 1.00	TWO 2.00	THREE 3.00	ROW TOTAL
MARRIED	1.00	5	18	3	26
		19.2	69.2	11.5	66.7
		45.5	72.0	100.0	
		12.8	46.2	7.7	
SINGLE	2.00	3	6	0	9
		33.3	66.7	0.0	23.1
		27.3	24.0	0.0	
		7.7	15.4	0.0	
DIVORCED	4.00	2	1	0	3
		66.7	33.3	0.0	7.7
		18.2	4.0	0.0	
		5.1	2.6	0.0	
SEPARATED	5.00	1	0	0	1
		100.0	0.0	0.0	2.6
		9.1	0.0	0.0	
		2.6	0.0	0.0	
	COLUMN TOTAL	11	25	3	39
		28.2	64.1	7.7	100.0

CHI SQUARE = 6.92727 WITH 6 DEGREES OF FREEDOM

TABLE 196

FILE TOTAL (CREATION DATE = 02/16/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *
MARITAL MARITAL STATUS BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
SEX SEX VALUE = 1.00 MALE
BY AGE AGE VALUE = 3.00 36-50 YEARS
* *

MARITAL	LEVEL COUNT ROW PCT COL PCT TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MARRIED	1.00	18 25.0 90.0 21.4	50 69.4 83.3 59.5	4 5.6 100.0 4.8	72 85.7
SINGLE	2.00	1 16.7 5.0 1.2	5 83.3 8.3 6.0	0 0.0 0.0 0.0	6 7.1
WIDOWED	3.00	0 0.0 0.0 0.0	1 100.0 1.7 1.2	0 0.0 0.0 0.0	1 1.2
DIVORCED	4.00	0 0.0 0.0 0.0	3 100.0 5.0 3.6	0 0.0 0.0 0.0	3 3.6
SEPARATED	5.00	1 50.0 5.0 1.2	1 50.0 1.7 1.2	0 0.0 0.0 0.0	2 2.4
	COLUMN TOTAL	20 23.8	60 71.4	4 4.8	84 100.0

CHI SQUARE = 3.11111 WITH 8 DEGREES OF FREEDOM

TABLE 197

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *
MARITAL MARITAL STATUS BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
SEX SEX VALUE = 1.00 MALE
BY AGE AGE VALUE = 4.00 51-65 YEARS
* *

MARITAL	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MARRIED	1.00	9	67	15	91
		9.9	73.6	16.5	77.1
		69.2	78.8	75.0	
		7.6	56.8	12.7	
SINGLE	2.00	3	11	0	14
		21.4	78.6	0.0	11.9
		23.1	12.9	0.0	
		2.5	9.3	0.0	
WIDOWED	3.00	0	5	2	7
		0.0	71.4	28.6	5.9
		0.0	5.9	10.0	
		0.0	4.2	1.7	
DIVORCED	4.00	1	2	1	4
		25.0	50.0	25.0	3.4
		7.7	2.4	5.0	
		0.8	1.7	0.8	
SEPARATED	5.00	0	0	2	2
		0.0	0.0	100.0	1.7
		0.0	0.0	10.0	
		0.0	0.0	1.7	
	COLUMN TOTAL	13	85	20	118
		11.0	72.0	16.9	100.0

CHI SQUARE = 16.24390 WITH 8 DEGREES OF FREEDOM

TABLE 198

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * *

MARITAL MARITAL STATUS BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

SEX SEX VALUE = 1.00 MALE

BY AGE AGE VALUE = 5.00 60-80 YEARS

* *

MARITAL	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MARRIED	1.00	7	47	6	60
		11.7	78.3	10.0	65.9
		53.8	70.1	54.5	
		7.7	51.6	6.6	
SINGLE	2.00	3	5	1	9
		33.3	55.6	11.1	9.9
		23.1	7.5	9.1	
		3.3	5.5	1.1	
WIDOWED	3.00	2	14	3	19
		10.5	73.7	15.8	20.9
		15.4	20.9	27.3	
		2.2	15.4	3.3	
DIVORCED	4.00	0	1	0	1
		0.0	100.0	0.0	1.1
		0.0	1.5	0.0	
		0.0	1.1	0.0	
SEPARATED	5.00	1	0	1	2
		50.0	0.0	50.0	2.2
		7.7	0.0	9.1	
		1.1	0.0	1.1	
	COLUMN TOTAL	13	67	11	91
		14.3	73.6	12.1	100.0

CHI SQUARE = 9.77493 WITH 8 DEGREES OF FREEDOM

TABLE 199

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *

MARITAL MARITAL STATUS BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

SEX SEX VALUE = 1.00 MALE

BY AGE AGE VALUE = 6.00 OVER 80 YEARS

* *

MARITAL	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MARRIED	1.00	5	18	4	27
		18.5	66.7	14.8	62.8
		100.0	58.1	57.1	
		11.6	41.9	9.3	
SINGLE	2.00	0	1	0	1
		0.0	100.0	0.0	2.3
		0.0	3.2	0.0	
		0.0	2.3	0.0	
WIDOWED	3.00	0	11	3	14
		0.0	78.6	21.4	32.6
		0.0	35.5	42.9	
		0.0	25.6	7.0	
SEPARATED	5.00	0	1	0	1
		0.0	100.0	0.0	2.3
		0.0	3.2	0.0	
		0.0	2.3	0.0	
	COLUMN TOTAL	5	31	7	43
		11.6	72.1	16.3	100.0

CHI SQUARE = 3.95958 WITH 6 DEGREES OF FREEDOM

TABLE 200

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * *
MARITAL MARITAL STATUS BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
SEX SEX VALUE = 2.00 FEMALE
BY AGE AGE VALUE = 1.00 UNDER 20 YEARS
* *

MARITAL	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MARRIED	1.00	0	2	2	4
		0.0	50.0	50.0	25.0
		0.0	18.2	100.0	
		0.0	12.5	12.5	
SINGLE	2.00	3	8	0	11
		27.3	72.7	0.0	68.8
		100.0	72.7	0.0	
		18.8	50.0	0.0	
SEPARATED	5.00	0	1	0	1
		0.0	100.0	0.0	6.3
		0.0	9.1	0.0	
		0.0	6.3	0.0	
	COLUMN TOTAL	3	11	2	16
		18.8	68.8	12.5	100.0

CHI SQUARE = 7.73554 WITH 4 DEGREES OF FREEDOM

TABLE 201

FILE TOTAL (CREATION DATE = 03/16/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *
MARITAL MARITAL STATUS BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
SEX SEX VALUE = 2.00 FEMALE
BY AGE AGE VALUE = 2.00 21-35 YEARS
* *

MARITAL	LEVEL: COUNT / ROW PCT / COL PCT / TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MARRIED	1.00	4	52	7	63
		6.3	82.5	11.1	74.1
		100.0	74.3	63.6	
		4.7	61.2	8.2	
SINGLE	2.00	0	9	3	12
		0.0	75.0	25.0	14.1
		0.0	12.9	27.3	
		0.0	10.6	3.5	
DIVORCED	4.00	0	4	0	4
		0.0	100.0	0.0	4.7
		0.0	5.7	0.0	
		0.0	4.7	0.0	
SEPARATED	5.00	0	3	1	4
		0.0	75.0	25.0	4.7
		0.0	4.3	9.1	
		0.0	3.5	1.2	
OTHER	6.00	0	2	0	2
		0.0	100.0	0.0	2.4
		0.0	2.9	0.0	
		0.0	2.4	0.0	
	COLUMN TOTAL	4	70	11	85
		4.7	82.4	12.9	100.0

CHI SQUARE = 4.46640 WITH 8 DEGREES OF FREEDOM

TABLE 202

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *
MARITAL MARITAL STATUS BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
SEX SEX VALUE = 2.00 FEMALE
BY AGE AGE VALUE = 3.00 31-50 YEARS
* *

MARITAL	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MARRIED	1.00	11	57	15	83
		13.3	68.7	18.1	84.7
		84.6	82.6	93.8	
		11.2	58.2	15.3	
SINGLE	2.00	0	2	1	3
		0.0	66.7	33.3	3.1
		0.0	2.9	6.3	
		0.0	2.0	1.0	
WIDOWED	3.00	1	1	0	2
		50.0	50.0	0.0	2.0
		7.7	1.4	0.0	
		1.0	1.0	0.0	
SEPARATED	5.00	1	9	0	10
		10.0	90.0	0.0	10.2
		7.7	13.0	0.0	
		1.0	9.2	0.0	
	COLUMN TOTAL	13	69	16	98
		13.3	70.4	16.3	100.0

CHI SQUARE = 5.86332 WITH 6 DEGREES OF FREEDOM

TABLE 203

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *

MARITAL MARITAL STATUS BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

SEX SEX VALUE = 2.00 FEMALE

BY AGE AGE VALUE = 4.00 51-65 YEARS

MARITAL	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MARRIED	1.00	3	43	18	64
		4.7	67.2	28.1	61.5
		60.0	56.6	78.3	
		2.9	41.3	17.3	
SINGLE	2.00	1	8	0	9
		11.1	88.9	0.0	8.7
		20.0	10.5	0.0	
		1.0	7.7	0.0	
WIDOWED	3.00	1	17	3	21
		4.8	81.0	14.3	20.2
		20.0	22.4	13.0	
		1.0	16.3	2.9	
DIVORCED	4.00	0	6	2	8
		0.0	75.0	25.0	7.7
		0.0	7.9	8.7	
		0.0	5.8	1.9	
SEPARATED	5.00	0	2	0	2
		0.0	100.0	0.0	1.9
		0.0	2.6	0.0	
		0.0	1.9	0.0	
	COLUMN TOTAL	5	76	23	104
		4.8	73.1	22.1	100.0

CHI SQUARE = 6.30655 WITH 8 DEGREES OF FREEDOM

TABLE 204

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *

MARITAL MARITAL STATUS. BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

SEX SEX VALUE = 2.00 FEMALE

BY AGE AGE VALUE = 5.00 66-80 YEARS

* *

MARITAL	LEVEL COUNT ROW PCT COL PCT TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
MARRIED	1.00	1 3.8 33.3 1.6	19 73.1 41.3 31.1	6 23.1 50.0 9.8	26 42.6
SINGLE	2.00	0 0.0 0.0 0.0	3 100.0 6.5 4.9	0 0.0 0.0 0.0	3 4.9
WIDOWED	3.00	2 6.9 66.7 3.3	23 79.3 50.0 37.7	4 13.8 33.3 6.6	29 47.5
DIVORCED	4.00	0 0.0 0.0 0.0	1 50.0 2.2 1.6	1 50.0 8.3 1.6	2 3.3
SEPARATED	5.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 8.3 1.6	1 1.6
	COLUMN TOTAL	3 4.9	46 75.4	12 19.7	61 100.0

CHI SQUARE = 7.29767 WITH 8 DEGREES OF FREEDOM

TABLE 205

```
FILE    TOTAL     (CREATION DATE = 03/16/71)

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * *
    MARITAL   MARITAL STATUS                                  BY  LEVEL      LEVEL OF CARE
CONTROLLING FOR..
    SEX        SEX                                            VALUE =        2.00  FEMALE
BY  AGE        AGE                                            VALUE =        6.00  OVER 80 YEARS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

MARITAL	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: III TWO 2.00	LEVEL: III THREE 3.00	ROW TOTAL
MARRIED	1.00	6	0	6
		100.0	0.0	14.6
		17.1	0.0	
		14.6	0.0	
SINGLE	2.00	5	0	5
		100.0	0.0	12.2
		14.3	0.0	
		12.2	0.0	
WIDOWED	3.00	24	6	30
		80.0	20.0	73.2
		68.6	100.0	
		58.5	14.6	
	COLUMN TOTAL	35	6	41
		85.4	14.6	100.0

CHI SQUARE =   2.57714 WITH   2 DEGREES OF FREEDOM

TABLE 206

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * *
AGE AGE BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
MARITAL MARITAL STATUS VALUE = 1.00 MARRIED
BY SEX SEX VALUE = 1.00 MALE
* *

AGE	LEVEL COUNT ROW PCT COL PCT TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
21-35 YEARS	2.00	5 19.2 11.4 1.8	18 69.2 9.0 6.5	3 11.5 9.4 1.1	26 9.4
36-50 YEARS	3.00	18 25.0 40.9 6.5	50 69.4 25.0 18.1	4 5.6 12.5 1.4	72 26.1
51-65 YEARS	4.00	9 9.9 20.5 3.3	67 73.6 33.5 24.3	15 16.5 46.9 5.4	91 33.0
66-80 YEARS	5.00	7 11.7 15.9 2.5	47 78.3 23.5 17.0	6 10.0 18.8 2.2	60 21.7
OVER 80 YEARS	6.00	5 18.5 11.4 1.8	18 66.7 9.0 6.5	4 14.8 12.5 1.4	27 9.8
	COLUMN TOTAL	44 15.9	200 72.5	32 11.6	276 100.0

CHI SQUARE = 11.84240 WITH 8 DEGREES OF FREEDOM

TABLE 207

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *

AGE AGE BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

MARITAL MARITAL STATUS VALUE = 2.00 SINGLE

BY SEX SEX VALUE = 1.00 MALE

AGE (COUNT / ROW PCT / COL PCT / TOT PCT)	LEVEL I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
1.00 UNDER 20 YEARS	2	8	1	11
	18.2	72.7	9.1	22.0
	16.7	22.2	50.0	
	4.0	16.0	2.0	
2.00 21-35 YEARS	3	6	0	9
	33.3	66.7	0.0	18.0
	25.0	16.7	0.0	
	6.0	12.0	0.0	
3.00 36-50 YEARS	1	5	0	6
	16.7	83.3	0.0	12.0
	8.3	13.9	0.0	
	2.0	10.0	0.0	
4.00 51-65 YEARS	3	11	0	14
	21.4	78.6	0.0	28.0
	25.0	30.6	0.0	
	6.0	22.0	0.0	
5.00 66-80 YEARS	3	5	1	9
	33.3	55.6	11.1	18.0
	25.0	13.9	50.0	
	6.0	10.0	2.0	
6.00 OVER 80 YEARS	0	1	0	1
	0.0	100.0	0.0	2.0
	0.0	2.8	0.0	
	0.0	2.0	0.0	
COLUMN TOTAL	12	36	2	50
	24.0	72.0	4.0	100.0

CHI SQUARE = 4.94628 WITH 10 DEGREES OF FREEDOM

TABLE 208

```
FILE    TOTAL     (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * *
    AGE       AGE                                                BY  LEVEL      LEVEL OF CARE
CONTROLLING FOR..
    MARITAL   MARITAL STATUS                                     VALUE =        3.00  WIDOWED
BY  SEX       SEX                                                VALUE =        1.00  MALE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                  LEVEL
            COUNT  I
          ROW PCT  II ONE     II TWO    III THRE   ROW
          COL PCT  I                        E       TOTAL
          TOT PCT  I     1.00I    2.00I    3.00I
AGE       --------I--------I--------I--------I
             3.00  I      0  I      1  I      0  I     1
  36-50 YEARS      I    0.0  I  100.0  I    0.0  I   2.4
                   I    0.0  I    3.2  I    0.0  I
                   I    0.0  I    2.4  I    0.0  I
                  -I--------I--------I--------I
             4.00  I      0  I      5  I      2  I     7
  51-65 YEARS      I    0.0  I   71.4  I   28.6  I  17.1
                   I    0.0  I   16.1  I   25.0  I
                   I    0.0  I   12.2  I    4.9  I
                  -I--------I--------I--------I
             5.00  I      2  I     14  I      3  I    19
  66-80 YEARS      I   10.5  I   73.7  I   15.8  I  46.3
                   I  100.0  I   45.2  I   37.5  I
                   I    4.9  I   34.1  I    7.3  I
                  -I--------I--------I--------I
             6.00  I      0  I     11  I      3  I    14
  OVER 80 YEARS    I    0.0  I   78.6  I   21.4  I  34.1
                   I    0.0  I   35.5  I   37.5  I
                   I    0.0  I   26.8  I    7.3  I
                  -I--------I--------I--------I
           COLUMN         2        31         8      41
            TOTAL       4.9      75.6      19.5   100.0

CHI SQUARE =     3.08705 WITH   6 DEGREES OF FREEDOM
```

TABLE 209

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *

AGE AGE BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

MARITAL MARITAL STATUS VALUE = 4.00 DIVORCED

BY SEX SEX VALUE = 1.00 MALE

* *

AGE	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
21-25 YEARS	2.00	2	1	0	3
		66.7	33.3	0.0	27.3
		66.7	14.3	0.0	
		18.2	9.1	0.0	
26-50 YEARS	3.00	0	3	0	3
		0.0	100.0	0.0	27.3
		0.0	42.9	0.0	
		0.0	27.3	0.0	
51-65 YEARS	4.00	1	2	1	4
		25.0	50.0	25.0	36.4
		33.3	28.6	100.0	
		9.1	18.2	9.1	
66-80 YEARS	5.00	0	1	0	1
		0.0	100.0	0.0	9.1
		0.0	14.3	0.0	
		0.0	9.1	0.0	
	COLUMN TOTAL	3	7	1	11
		27.3	63.6	9.1	100.0

CHI SQUARE = 5.93650 WITH 6 DEGREES OF FREEDOM

TABLE 210

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * *
AGE AGE BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
MARITAL MARITAL STATUS VALUE = 5.00 SEPARATED
BY SEX SEX VALUE = 1.00 MALE
* *

AGE	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: II ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
21-35 YEARS	2.00	1	0	0	1
		100.0	0.0	0.0	12.5
		33.3	0.0	0.0	
		12.5	0.0	0.0	
36-50 YEARS	3.00	1	1	0	2
		50.0	50.0	0.0	25.0
		33.3	50.0	0.0	
		12.5	12.5	0.0	
51-65 YEARS	4.00	0	0	2	2
		0.0	0.0	100.0	25.0
		0.0	0.0	66.7	
		0.0	0.0	25.0	
66-80 YEARS	5.00	1	0	1	2
		50.0	0.0	50.0	25.0
		33.3	0.0	33.3	
		12.5	0.0	12.5	
OVER 80 YEARS	6.00	0	1	0	1
		0.0	100.0	0.0	12.5
		0.0	50.0	0.0	
		0.0	12.5	0.0	
	COLUMN TOTAL	3	2	3	8
		37.5	25.0	37.5	100.0

CHI SQUARE = 10.00000 WITH 8 DEGREES OF FREEDOM

TABLE 211

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * *
AGE AGE BY LEVEL LEVEL OF CARE
CONTROLLING FOR..
MARITAL MARITAL STATUS VALUE = 1.00 MARRIED
BY SEX SEX VALUE = 2.00 FEMALE
* *

AGE	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
1.00 UNDER 20 YEARS		0	2	2	4
		0.0	50.0	50.0	1.6
		0.0	1.1	4.2	
		0.0	0.8	0.8	
2.00 21-35 YEARS		4	52	7	63
		6.3	82.5	11.1	25.6
		21.1	29.1	14.6	
		1.6	21.1	2.8	
3.00 36-50 YEARS		11	57	15	83
		13.3	68.7	18.1	33.7
		57.9	31.8	31.3	
		4.5	23.2	6.1	
4.00 51-65 YEARS		3	43	18	64
		4.7	67.2	28.1	26.0
		15.8	24.0	37.5	
		1.2	17.5	7.3	
5.00 66-80 YEARS		1	19	6	26
		3.8	73.1	23.1	10.6
		5.3	10.6	12.5	
		0.4	7.7	2.4	
6.00 OVER 80 YEARS		0	6	0	6
		0.0	100.0	0.0	2.4
		0.0	3.4	0.0	
		0.0	2.4	0.0	
	COLUMN TOTAL	19	179	48	246
		7.7	72.8	19.5	100.0

CHI SQUARE = 15.71619 WITH 10 DEGREES OF FREEDOM

TABLE 212

FILE TOTAL (CREATION DATE = 03/16/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *

ACE AGE BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

MARITAL MARITAL STATUS VALUE = 2.00 SINGLE

BY SEX SEX VALUE = 2.00 FEMALE

* *

AGE	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
UNDER 20 YEARS	1.00	3	8	0	11
		27.3	72.7	0.0	25.6
		75.0	22.9	0.0	
		7.0	18.6	0.0	
21-35 YEARS	2.00	0	9	3	12
		0.0	75.0	25.0	27.9
		0.0	25.7	75.0	
		0.0	20.9	7.0	
36-50 YEARS	3.00	0	2	1	3
		0.0	66.7	33.3	7.0
		0.0	5.7	25.0	
		0.0	4.7	2.3	
51-65 YEARS	4.00	1	8	0	9
		11.1	88.9	0.0	20.9
		25.0	22.9	0.0	
		2.3	18.6	0.0	
66-80 YEARS	5.00	0	3	0	3
		0.0	100.0	0.0	7.0
		0.0	8.6	0.0	
		0.0	7.0	0.0	
OVER 80 YEARS	6.00	0	5	0	5
		0.0	100.0	0.0	11.6
		0.0	14.3	0.0	
		0.0	11.6	0.0	
	COLUMN TOTAL	4	35	4	43
		9.3	81.4	9.3	100.0

CHI SQUARE = 14.27961 WITH 10 DEGREES OF FREEDOM

TABLE 213

FILE TOTAL (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *

AGE AGE BY LEVEL LEVEL OF CARE

CONTROLLING FOR..

MARITAL MARITAL STATUS VALUE = 3.00 WIDOWED

BY SEX SEX VALUE = 2.00 FEMALE

* *

AGE	COUNT / ROW PCT / COL PCT / TOT PCT	LEVEL: I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
36-50 YEARS	3.00	1	1	0	2
		50.0	50.0	0.0	2.4
		25.0	1.5	0.0	
		1.2	1.2	0.0	
51-65 YEARS	4.00	1	17	3	21
		4.8	81.0	14.3	25.6
		25.0	26.2	23.1	
		1.2	20.7	3.7	
66-80 YEARS	5.00	2	23	4	29
		6.9	79.3	13.8	35.4
		50.0	35.4	30.8	
		2.4	28.0	4.9	
OVER 80 YEARS	6.00	0	24	6	30
		0.0	80.0	20.0	36.6
		0.0	36.9	46.2	
		0.0	29.3	7.3	
	COLUMN TOTAL	4	65	13	82
		4.9	79.3	15.9	100.0

CHI SQUARE = 11.03209 WITH 6 DEGREES OF FREEDOM

TABLE 214

```
FILE    TOTAL     (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * *  C R O S S T A B U L A T I O N   O F  * * * * * *
    AGE       AGE                                                    BY  LEVEL      LEVEL OF CARE
CONTROLLING FOR..
    MARITAL   MARITAL STATUS                                         VALUE =        4.00  DIVORCED
BY  SEX       SEX                                                    VALUE =        2.00  FEMALE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                  LEVEL
          COUNT  I
          ROW PCT III TWO   III THRE    ROW
          COL PCT I          E          TOTAL
          TOT PCT I    2.00I    3.00I
AGE       --------I--------I--------I
             2.00 I      4 I      0 I      4
  21-35 YEARS     I  100.0 I    0.0 I   28.6
                  I   36.4 I    0.0 I
                  I   28.6 I    0.0 I
                 -I--------I--------I
             4.00 I      6 I      2 I      8
  51-65 YEARS     I   75.0 I   25.0 I   57.1
                  I   54.5 I   66.7 I
                  I   42.9 I   14.3 I
                 -I--------I--------I
             5.00 I      1 I      1 I      2
  66-80 YEARS     I   50.0 I   50.0 I   14.3
                  I    9.1 I   33.3 I
                  I    7.1 I    7.1 I
                 -I--------I--------I
           COLUMN       11         3      14
            TOTAL     78.6      21.4   100.0

CHI SQUARE =      2.12121 WITH    2 DEGREES OF FREEDOM
```

TABLE 215

FILE TOTAL (CREATION DATE = 03/16/71)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * *

AGE	AGE	BY LEVEL	LEVEL OF CARE
CONTROLLING FOR..			
MARITAL	MARITAL STATUS	VALUE =	5.00 SEPARATED
BY SEX	SEX	VALUE =	2.00 FEMALE

* *

AGE	LEVEL COUNT ROW PCT COL PCT TOT PCT	I ONE 1.00	II TWO 2.00	III THREE 3.00	ROW TOTAL
UNDER 20 YEARS	1.00	0 0.0 0.0 0.0	1 100.0 6.7 5.6	0 0.0 0.0 0.0	1 5.6
21-35 YEARS	2.00	0 0.0 0.0 0.0	3 75.0 20.0 16.7	1 25.0 50.0 5.6	4 22.2
36-50 YEARS	3.00	1 10.0 100.0 5.6	9 90.0 60.0 50.0	0 0.0 0.0 0.0	10 55.6
51-65 YEARS	4.00	0 0.0 0.0 0.0	2 100.0 13.3 11.1	0 0.0 0.0 0.0	2 11.1
66-80 YEARS	5.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 50.0 5.6	1 5.6
	COLUMN TOTAL	1 5.6	15 83.3	2 11.1	18 100.0

CHI SQUARE = 11.07000 WITH 8 DEGREES OF FREEDOM

TABLE 216

```
FILE   TOTAL     (CREATION DATE = 03/18/71)

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * *
    AGE        AGE                                                   BY  LEVEL     LEVEL OF CARE
CONTROLLING FOR..
    MARITAL    MARITAL STATUS                                        VALUE =       6.00  OTHER
BY  SEX        SEX                                                   VALUE =       2.00  FEMALE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                     LEVEL
             COUNT  I
           ROW PCT III TWO      ROW
           COL PCT I            TOTAL
           TOT PCT I     2.00I
AGE        --------I--------I
             2.00  I       2  I      2
  21-39 YEARS      I 100.0  I 100.0
                   I 100.0  I
                   I 100.0  I
                  -I--------I
           COLUMN        2         2
            TOTAL    100.0     100.0
```

APPENDIX E

Tests By Elements A, B, and C of Direct Nursing Care

Nominal Test - Chi-Square

Ordinal Tests - Kruskal-Wallis, Spearman rho

Interval Tests - Anova-F-Test, Pearson r

Tables 217 to 223

TABLE 217

FILE TOTAL (CREATION DATE = 03/20/71)

CROSSTABULATION OF A BY ELEVEL EXTENDED LEVEL OF CARE

A \ ELEVEL COUNT ROW PCT COL PCT TOT PCT	I ONE 1.00	II NOT Y 2.00	II EXTEN 2.50	III THRE 3.00	ROW TOTAL
0.0	14 45.2 15.2 1.8	10 32.3 2.0 1.3	7 22.6 8.1 0.9	0 0.0 0.0 0.0	31 3.9
2.00	42 23.0 45.7 5.3	117 63.9 23.5 14.8	21 11.5 24.4 2.7	3 1.6 2.6 0.4	183 23.1
5.00	1 16.7 1.1 0.1	5 83.3 1.0 0.6	0 0.0 0.0 0.0	0 0.0 0.0 0.0	6 0.8
7.00	20 20.0 21.7 2.5	55 55.0 11.1 7.0	23 23.0 26.7 2.9	2 2.0 1.7 0.3	100 12.6
10.00	15 11.6 16.3 1.9	83 64.3 16.7 10.5	8 6.2 9.3 1.0	23 17.8 19.8 2.9	129 16.3
12.00	0 0.0 0.0 0.0	3 75.0 0.6 0.4	0 0.0 0.0 0.0	1 25.0 0.9 0.1	4 0.5
15.00	0 0.0 0.0 0.0	39 72.2 7.8 4.9	5 9.3 5.8 0.6	10 18.5 8.6 1.3	54 6.8
17.00	0 0.0 0.0 0.0	80 82.5 16.1 10.1	13 13.4 15.1 1.6	4 4.1 3.4 0.5	97 12.3
20.00	0 0.0 0.0 0.0	4 100.0 0.8 0.5	0 0.0 0.0 0.0	0 0.0 0.0 0.0	4 0.5
25.00	0 0.0 0.0 0.0	70 66.0 14.1 8.8	8 7.5 9.3 1.0	28 26.4 24.1 3.5	106 13.4
27.00	0 0.0 0.0 0.0	11 100.0 2.2 1.4	0 0.0 0.0 0.0	0 0.0 0.0 0.0	11 1.4
30.00	0 0.0 0.0 0.0	4 80.0 0.8 0.5	1 20.0 1.2 0.1	0 0.0 0.0 0.0	5 0.6
32.00	0 0.0 0.0 0.0	6 85.7 1.2 0.8	0 0.0 0.0 0.0	1 14.3 0.9 0.1	7 0.9
35.00	0 0.0 0.0 0.0	1 50.0 0.2 0.1	0 0.0 0.0 0.0	1 50.0 0.9 0.1	2 0.3
COLUMN TOTAL	92 11.6	497 62.8	86 10.9	116 14.7	791 100.0

(CONTINUED)

TABLE 217-Continued

FILE TOTAL (CREATION DATE = 03/20/71)

* * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * *
A BY CLEVEL EXTENDED LEVEL OF CARE
* *

COUNT ROW PCT COL PCT TOT PCT	ELEVEL I ONE 1.00	II NOT X 2.00	II EXTEN 2.50	III THRE 3.00	ROW TOTAL
A					
40.00	0	6	0	2	8
	0.0	75.0	0.0	25.0	1.0
	0.0	1.2	0.0	1.7	
	0.0	0.8	0.0	0.3	
42.00	0	3	0	0	3
	0.0	100.0	0.0	0.0	0.4
	0.0	0.6	0.0	0.0	
	0.0	0.4	0.0	0.0	
50.00	0	0	0	13	13
	0.0	0.0	0.0	100.0	1.6
	0.0	0.0	0.0	11.2	
	0.0	0.0	0.0	1.6	
52.00	0	0	0	3	3
	0.0	0.0	0.0	100.0	0.4
	0.0	0.0	0.0	2.6	
	0.0	0.0	0.0	0.4	
55.00	0	0	0	1	1
	0.0	0.0	0.0	100.0	0.1
	0.0	0.0	0.0	0.9	
	0.0	0.0	0.0	0.1	
57.00	0	0	0	2	2
	0.0	0.0	0.0	100.0	0.3
	0.0	0.0	0.0	1.7	
	0.0	0.0	0.0	0.3	
60.00	0	0	0	4	4
	0.0	0.0	0.0	100.0	0.5
	0.0	0.0	0.0	3.4	
	0.0	0.0	0.0	0.5	
A					
65.00	0	0	0	2	2
	0.0	0.0	0.0	100.0	0.3
	0.0	0.0	0.0	1.7	
	0.0	0.0	0.0	0.3	
67.00	0	0	0	2	2
	0.0	0.0	0.0	100.0	0.3
	0.0	0.0	0.0	1.7	
	0.0	0.0	0.0	0.3	
75.00	0	0	0	6	6
	0.0	0.0	0.0	100.0	0.8
	0.0	0.0	0.0	5.2	
	0.0	0.0	0.0	0.8	
77.00	0	0	0	3	3
	0.0	0.0	0.0	100.0	0.4
	0.0	0.0	0.0	2.6	
	0.0	0.0	0.0	0.4	
85.00	0	0	0	1	1
	0.0	0.0	0.0	100.0	0.1
	0.0	0.0	0.0	0.9	
	0.0	0.0	0.0	0.1	
90.00	0	0	0	1	1
	0.0	0.0	0.0	100.0	0.1
	0.0	0.0	0.0	0.9	
	0.0	0.0	0.0	0.1	
100.00	0	0	0	2	2
	0.0	0.0	0.0	100.0	0.3
	0.0	0.0	0.0	1.7	
	0.0	0.0	0.0	0.3	
125.00	0	0	0	1	1
	0.0	0.0	0.0	100.0	0.1
	0.0	0.0	0.0	0.9	
	0.0	0.0	0.0	0.1	
COLUMN TOTAL	92 11.6	497 62.8	86 10.9	116 14.7	791 100.0

CHI SQUARE = 437.31470 WITH 89 DEGREES OF FREEDOM

TABLE 218

FILE TOTAL (CREATION DATE = 03/20/71)

C R O S S T A B U L A T I O N O F

B

BY ELEVEL EXTENDED LEVEL OF CARE

B

COUNT ROW PCT COL PCT TOT PCT	ELEVEL ONE 1.00	II NOT X 2.00	II EXTEN 2.50	III THRE 3.00	ROW TOTAL
0.0	8 34.8 8.7 1.0	14 60.9 2.8 1.8	0 0.0 0.0 0.0	1 4.3 0.9 0.1	23 2.9
1.00	17 34.7 18.5 2.1	27 55.1 5.4 3.4	0 0.0 0.0 0.0	5 10.2 4.3 0.6	49 6.2
2.00	1 25.0 1.1 0.1	2 50.0 0.4 0.3	1 25.0 1.2 0.1	0 0.0 0.0 0.0	4 0.5
3.00	61 31.0 66.3 7.7	109 55.3 21.9 13.8	21 10.7 24.4 2.7	6 3.0 5.2 0.8	197 24.9
4.00	3 13.0 3.3 0.4	17 73.9 3.4 2.1	2 8.7 2.3 0.3	1 4.3 0.9 0.1	23 2.9
5.00	1 100.0 1.1 0.1	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 0.1
6.00	0 0.0 0.0 0.0	22 88.0 4.4 2.8	3 12.0 3.5 0.4	0 0.0 0.0 0.0	25 3.2
7.00	0 0.0 0.0 0.0	10 83.3 2.0 1.3	2 16.7 2.3 0.3	0 0.0 0.0 0.0	12 1.5
8.00	0 0.0 0.0 0.0	17 89.5 3.4 2.1	2 10.5 2.3 0.3	0 0.0 0.0 0.0	19 2.4
9.00	0 0.0 0.0 0.0	2 50.0 0.4 0.3	2 50.0 2.3 0.3	0 0.0 0.0 0.0	4 0.5
10.00	0 0.0 0.0 0.0	70 86.4 14.1 8.8	10 12.3 11.6 1.3	1 1.2 0.9 0.1	81 10.2
11.00	1 3.4 1.1 0.1	24 82.8 4.8 3.0	3 10.3 3.5 0.4	1 3.4 0.9 0.1	29 3.7
12.00	0 0.0 0.0 0.0	3 75.0 0.6 0.4	1 25.0 1.2 0.1	0 0.0 0.0 0.0	4 0.5
13.00	0 0.0 0.0 0.0	57 78.1 11.5 7.2	13 17.8 15.1 1.6	3 4.1 2.6 0.4	73 9.2
COLUMN TOTAL	92 11.6	497 62.8	86 10.9	116 14.7	791 100.0

(CONTINUED)

TABLE 218-Continued

FILE TOTAL (CREATION DATE = 03/20/71)

C R O S S T A B U L A T I O N O F
B BY ELEVEL EXTENDED LEVEL OF CARE

B	COUNT ROW PCT COL PCT TOT PCT	ELEVEL ONE 1.00	II NOT X 2.00	II EXTEN 2.50	III THRE 3.00	ROW TOTAL
	14.00	0 0.0 0.0 0.0	8 66.7 1.6 1.0	3 25.0 3.5 0.4	1 8.3 0.9 0.1	12 1.5
	15.00	0 0.0 0.0 0.0	7 58.3 1.4 0.9	3 25.0 3.5 0.4	2 16.7 1.7 0.3	12 1.5
	16.00	0 0.0 0.0 0.0	8 88.9 1.6 1.0	0 0.0 0.0 0.0	1 11.1 0.9 0.1	9 1.1
	17.00	0 0.0 0.0 0.0	5 83.3 1.0 0.6	1 16.7 1.2 0.1	0 0.0 0.0 0.0	6 0.8
	18.00	0 0.0 0.0 0.0	5 71.4 1.0 0.6	2 28.6 2.3 0.3	0 0.0 0.0 0.0	7 0.9
	19.00	0 0.0 0.0 0.0	1 100.0 0.2 0.1	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 0.1
	20.00	0 0.0 0.0 0.0	49 81.7 9.9 6.2	9 15.0 10.5 1.1	2 3.3 1.7 0.3	60 7.6
B	21.00	0 0.0 0.0 0.0	2 50.0 0.4 0.3	1 25.0 1.2 0.1	1 25.0 0.9 0.1	4 0.5
	22.00	0 0.0 0.0 0.0	1 33.3 0.2 0.1	1 33.3 1.2 0.1	1 33.3 0.9 0.1	3 0.4
	23.00	0 0.0 0.0 0.0	21 100.0 4.2 2.7	0 0.0 0.0 0.0	0 0.0 0.0 0.0	21 2.7
	24.00	0 0.0 0.0 0.0	3 75.0 0.6 0.4	1 25.0 1.2 0.1	0 0.0 0.0 0.0	4 0.5
	25.00	0 0.0 0.0 0.0	2 33.3 0.4 0.3	3 50.0 3.5 0.4	1 16.7 0.9 0.1	6 0.8
	26.00	0 0.0 0.0 0.0	4 80.0 0.8 0.5	1 20.0 1.2 0.1	0 0.0 0.0 0.0	5 0.6
	27.00	0 0.0 0.0 0.0	2 28.6 0.4 0.3	1 14.3 1.2 0.1	4 57.1 3.4 0.5	7 0.9
	COLUMN TOTAL	92 11.6	497 62.8	86 10.9	116 14.7	791 100.0

(CONTINUED)

TABLE 218-Continued

FILE TOTAL (CREATION DATE = 03/20/71)

C R O S S T A B U L A T I O N O F B BY ELEVEL EXTENDED LEVEL OF CARE

B	ELEVEL COUNT I ROW PCT I COL PCT I TOT PCT I	II ONE 1.00	II NOT X II 2.00	EXTEN 2.50	III THRE 3.00	ROW TOTAL
	28.00	0 0.0 0.0 0.0	3 75.0 0.6 0.4	0 0.0 0.0 0.0	1 25.0 0.9 0.1	4 0.5
	29.00	0 0.0 0.0 0.0	1 100.0 0.2 0.1	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 0.1
	30.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	27 100.0 23.3 3.4	27 3.4
	31.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	6 100.0 5.2 0.8	6 0.8
	32.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 0.9 0.1	1 0.1
	33.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	10 100.0 8.6 1.3	10 1.3
	34.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 0.9 0.1	1 0.1
B	35.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	3 100.0 2.6 0.4	3 0.4
	36.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 0.9 0.1	1 0.1
	37.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	4 100.0 3.4 0.5	4 0.5
	38.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	3 100.0 2.6 0.4	3 0.4
	39.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 0.9 0.1	1 0.1
	40.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	8 100.0 6.9 1.0	8 1.0
	41.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 0.9 0.1	1 0.1
	COLUMN TOTAL	92 11.6	497 62.8	86 10.9	116 14.7	791 100.0

(CONTINUED)

TABLE 218-Continued

FILE TOTAL (CREATION DATE = 03/20/71)

C R O S S T A B U L A T I O N O F

B BY ELEVEL EXTENDED LEVEL OF CARE

B	ELEVEL				
COUNT / ROW PCT / COL PCT / TOT PCT	II ONE 1.00	II NOT X 2.00	II EXTEN 2.50	III THRE 3.00	ROW TOTAL
42.00	0	0	0	7	7
	0.0	0.0	0.0	100.0	0.9
	0.0	0.0	0.0	6.0	
	0.0	0.0	0.0	0.9	
43.00	0	1	0	2	3
	0.0	33.3	0.0	66.7	0.4
	0.0	0.2	0.0	1.7	
	0.0	0.1	0.0	0.3	
45.00	0	0	0	2	2
	0.0	0.0	0.0	100.0	0.3
	0.0	0.0	0.0	1.7	
	0.0	0.0	0.0	0.3	
47.00	0	0	0	1	1
	0.0	0.0	0.0	100.0	0.1
	0.0	0.0	0.0	0.9	
	0.0	0.0	0.0	0.1	
48.00	0	0	0	2	2
	0.0	0.0	0.0	100.0	0.3
	0.0	0.0	0.0	1.7	
	0.0	0.0	0.0	0.3	
50.00	0	0	0	1	1
	0.0	0.0	0.0	100.0	0.1
	0.0	0.0	0.0	0.9	
	0.0	0.0	0.0	0.1	
51.00	0	0	0	2	2
	0.0	0.0	0.0	100.0	0.3
	0.0	0.0	0.0	1.7	
	0.0	0.0	0.0	0.3	
52.00	0	0	0	1	1
	0.0	0.0	0.0	100.0	0.1
	0.0	0.0	0.0	0.9	
	0.0	0.0	0.0	0.1	
COLUMN TOTAL	92	497	86	116	791
	11.6	62.8	10.9	14.7	100.0

CHI SQUARE = 781.81922 WITH 147 DEGREES OF FREEDOM

TABLE 219

FILE TOTAL (CREATION DATE = 03/20/71)

CROSSTABULATION OF
C BY ELEVEL EXTENDED LEVEL OF CARE

C	COUNT ROW PCT COL PCT TOT PCT	ELEVEL ONE 1.00	II NOT X 2.00	II EXTEN 2.50	III THRE 3.00	ROW TOTAL
	0.0	12 34.3 13.0 1.5	19 54.3 3.8 2.4	1 2.9 1.2 0.1	3 8.6 2.6 0.4	35 4.4
	3.00	67 33.3 72.8 8.5	111 55.2 22.3 14.0	11 5.5 12.8 1.4	12 6.0 10.3 1.5	201 25.4
	4.00	4 80.0 4.3 0.5	1 20.0 0.2 0.1	0 0.0 0.0 0.0	0 0.0 0.0 0.0	5 0.6
	5.00	0 0.0 0.0 0.0	1 100.0 0.2 0.1	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 0.1
	6.00	2 28.6 2.2 0.3	3 42.9 0.6 0.4	0 0.0 0.0 0.0	2 28.6 1.7 0.3	7 0.9
	7.00	0 0.0 0.0 0.0	3 100.0 0.6 0.4	0 0.0 0.0 0.0	0 0.0 0.0 0.0	3 0.4
	8.00	0 0.0 0.0 0.0	2 100.0 0.4 0.3	0 0.0 0.0 0.0	0 0.0 0.0 0.0	2 0.3
	9.00	4 28.6 4.3 0.5	7 50.0 1.4 0.9	0 0.0 0.0 0.0	3 21.4 2.6 0.4	14 1.8
	10.00	3 20.0 3.3 0.4	12 80.0 2.4 1.5	0 0.0 0.0 0.0	0 0.0 0.0 0.0	15 1.9
	13.00	0 0.0 0.0 0.0	25 92.6 5.0 3.2	1 3.7 1.2 0.1	1 3.7 0.9 0.1	27 3.4
	14.00	0 0.0 0.0 0.0	4 100.0 0.8 0.5	0 0.0 0.0 0.0	0 0.0 0.0 0.0	4 0.5
	16.00	0 0.0 0.0 0.0	101 79.5 20.3 12.8	12 9.4 14.0 1.5	14 11.0 12.1 1.8	127 16.1
	17.00	0 0.0 0.0 0.0	11 84.6 2.2 1.4	1 7.7 1.2 0.1	1 7.7 0.9 0.1	13 1.6
	19.00	0 0.0 0.0 0.0	15 75.0 3.0 1.9	2 10.0 2.3 0.3	3 15.0 2.6 0.4	20 2.5
	COLUMN TOTAL	92 11.6	497 62.8	86 10.9	116 14.7	791 100.0

(CONTINUED)

TABLE 219-Continued

FILE TOTAL (CREATION DATE = 03/20/71)

CROSSTABULATION OF
C BY ELEVEL EXTENDED LEVEL OF CARE

ELEVEL COUNT ROW PCT COL PCT TOT PCT	ONE 1.00	II NOT X 2.00	II EXTEN 2.50	III THRE 3.00	ROW TOTAL
C					
20.00	0	13	1	3	17
	0.0	76.5	5.9	17.6	2.1
	0.0	2.6	1.2	2.6	
	0.0	1.6	0.1	0.4	
21.00	0	6	2	2	10
	0.0	60.0	20.0	20.0	1.3
	0.0	1.2	2.3	1.7	
	0.0	0.8	0.3	0.3	
22.00	0	6	3	5	14
	0.0	42.9	21.4	35.7	1.8
	0.0	1.2	3.5	4.3	
	0.0	0.8	0.4	0.6	
23.00	0	12	3	4	19
	0.0	63.2	15.8	21.1	2.4
	0.0	2.4	3.5	3.4	
	0.0	1.5	0.4	0.5	
24.00	0	0	2	0	2
	0.0	0.0	100.0	0.0	0.3
	0.0	0.0	2.3	0.0	
	0.0	0.0	0.3	0.0	
26.00	0	22	2	10	34
	0.0	64.7	5.9	29.4	4.3
	0.0	4.4	2.3	8.6	
	0.0	2.8	0.3	1.3	
27.00	0	3	0	1	4
	0.0	75.0	0.0	25.0	0.5
	0.0	0.6	0.0	0.9	
	0.0	0.4	0.0	0.1	
28.00	0	3	0	0	3
	0.0	100.0	0.0	0.0	0.4
	0.0	0.6	0.0	0.0	
	0.0	0.4	0.0	0.0	
29.00	0	41	11	12	64
	0.0	64.1	17.2	18.8	8.1
	0.0	8.2	12.8	10.3	
	0.0	5.2	1.4	1.5	
30.00	0	5	1	4	10
	0.0	50.0	10.0	40.0	1.3
	0.0	1.0	1.2	3.4	
	0.0	0.6	0.1	0.5	
31.00	0	1	0	2	3
	0.0	33.3	0.0	66.7	0.4
	0.0	0.2	0.0	1.7	
	0.0	0.1	0.0	0.3	
32.00	0	11	2	2	15
	0.0	73.3	13.3	13.3	1.9
	0.0	2.2	2.3	1.7	
	0.0	1.4	0.3	0.3	
33.00	0	10	1	9	20
	0.0	50.0	5.0	45.0	2.5
	0.0	2.0	1.2	7.8	
	0.0	1.3	0.1	1.1	
34.00	0	2	0	0	2
	0.0	100.0	0.0	0.0	0.3
	0.0	0.4	0.0	0.0	
	0.0	0.3	0.0	0.0	
COLUMN	92	497	86	116	791
TOTAL	11.6	62.8	10.9	14.7	100.0

(CONTINUED)

TABLE 219-Continued

FILE TOTAL (CREATION DATE = 03/20/71)

CROSSTABULATION OF

BY ELEVEL EXTENDED LEVEL OF CARE

COUNT ROW PCT COL PCT TOT PCT	ELEVEL ONE 1.00	II NOT X 2.00	II EXTEN 2.50	III THRE 3.00	ROW TOTAL
35.00	0 0.0 0.0 0.0	10 83.3 2.0 1.3	2 16.7 2.3 0.3	0 0.0 0.0 0.0	12 1.5
36.00	0 0.0 0.0 0.0	4 80.0 0.8 0.5	1 20.0 1.2 0.1	0 0.0 0.0 0.0	5 0.6
37.00	0 0.0 0.0 0.0	1 50.0 0.2 0.1	1 50.0 1.2 0.1	0 0.0 0.0 0.0	2 0.3
38.00	0 0.0 0.0 0.0	2 50.0 0.4 0.3	1 25.0 1.2 0.1	1 25.0 0.9 0.1	4 0.5
39.00	0 0.0 0.0 0.0	3 37.5 0.6 0.4	2 25.0 2.3 0.3	3 37.5 2.6 0.4	8 1.0
40.00	0 0.0 0.0 0.0	1 100.0 0.2 0.1	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 0.1
41.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	3 75.0 3.5 0.4	1 25.0 0.9 0.1	4 0.5
42.00	0 0.0 0.0 0.0	8 72.7 1.6 1.0	3 27.3 3.5 0.4	0 0.0 0.0 0.0	11 1.4
43.00	0 0.0 0.0 0.0	1 50.0 0.2 0.1	0 0.0 0.0 0.0	1 50.0 0.9 0.1	2 0.3
44.00	0 0.0 0.0 0.0	1 25.0 0.2 0.1	2 50.0 2.3 0.3	1 25.0 0.9 0.1	4 0.5
45.00	0 0.0 0.0 0.0	1 100.0 0.2 0.1	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 0.1
46.00	0 0.0 0.0 0.0	1 33.3 0.2 0.1	0 0.0 0.0 0.0	2 66.7 1.7 0.3	3 0.4
47.00	0 0.0 0.0 0.0	2 100.0 0.4 0.3	0 0.0 0.0 0.0	0 0.0 0.0 0.0	2 0.3
48.00	0 0.0 0.0 0.0	1 25.0 0.2 0.1	3 75.0 3.5 0.4	0 0.0 0.0 0.0	4 0.5
COLUMN TOTAL	92 11.6	497 62.8	86 10.9	116 14.7	791 100.0

(CONTINUED)

TABLE 219-Continued

FILE, TOTAL (CREATION DATE = 05/20/71)

C R O S S T A B U L A T I O N O F
BY LLEVEL EXTENDED LEVEL OF CARE

COUNT ROW PCT COL PCT TOT PCT	LLEVEL ONE 1.00	II NOT X 2.00	II EXTEN 2.50	III THRE 3.00	ROW TOTAL
49.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 50.0 1.2 0.1	1 50.0 0.9 0.1	2 0.3
51.00	0 0.0 0.0 0.0	1 50.0 0.2 0.1	0 0.0 0.0 0.0	1 50.0 0.9 0.1	2 0.3
52.00	0 0.0 0.0 0.0	3 60.0 0.6 0.4	0 0.0 0.0 0.0	2 40.0 1.7 0.3	5 0.6
53.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 0.9 0.1	1 0.1
55.00	0 0.0 0.0 0.0	2 40.0 0.4 0.3	2 40.0 2.3 0.3	1 20.0 0.9 0.1	5 0.6
56.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	3 75.0 3.5 0.4	1 25.0 0.9 0.1	4 0.5
57.00	0 0.0 0.0 0.0	2 66.7 0.4 0.3	0 0.0 0.0 0.0	1 33.3 0.9 0.1	3 0.4
58.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 0.9 0.1	1 0.1
60.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 0.9 0.1	1 0.1
61.00	0 0.0 0.0 0.0	1 33.3 0.2 0.1	1 33.3 1.2 0.1	1 33.3 0.9 0.1	3 0.4
63.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 0.9 0.1	1 0.1
65.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 1.2 0.1	0 0.0 0.0 0.0	1 0.1
66.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 1.2 0.1	0 0.0 0.0 0.0	1 0.1
67.00	0 0.0 0.0 0.0	1 100.0 0.2 0.1	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 0.1
68.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 1.2 0.1	0 0.0 0.0 0.0	1 0.1
70.00	0 0.0 0.0 0.0	1 100.0 0.2 0.1	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 0.1
71.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 0.9 0.1	1 0.1
74.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 50.0 1.2 0.1	1 50.0 0.9 0.1	2 0.3
77.00	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 1.2 0.1	0 0.0 0.0 0.0	1 0.1
COLUMN TOTAL	92 11.6	497 62.8	86 10.9	116 14.7	791 100.0

CHI SQUARE = 473.09053 WITH 180 DEGREES OF FREEDOM

TABLE 220

```
        EY TOTAL  K-W  GROUPS=LEVELS 1-3    VARIABLES 1=A 2=B 3=O
  1 791    3    3    1    G    1
             NO. OF FORMAT CARDS =       1
             NO. OF OBSERVATIONS =    791
             NO. OF INPUT VARIABLES =      3
             TOTAL NO. OF VARIABLES =      3
             SPECIFICATIONS FOR THIS PROBLEM
                 NO RANK CORRELATIONS
                 KRUSKAL-WALLIS ANALYSIS BETWEEN SUCCESSIVE GROUPS
                 NO COEFFICIENT OF CONCORDANCE.
                 DATA IS UNRANKED
                 DATA INPUT FROM CARDS
(17x,3f3.0)
             (17X,3F3.0)
  3   92  583  116
             NO. OF GROUPS =   3
                 GROUP NUMBER          1     2     3
                 NO. IN GROUP         92.  583.  116.

   KRUSKAL-WALLIS ANALYSIS OF VARIANCE
```

VARIABLE	H	DF	SUMS OF RANKS		
1	183.670	2.00	16792.50	226105.50	70338.00
2	265.618	1.00	13266.50	224239.50	75830.00
3	155.296	2.00	12650.00	240979.00	59607.00

TABLE 221

```
        EV TOTAL SPEARMAN RHO  1=LEVEL  2=A  3=B  4=C
  1  791     4     4     2     1     1

                 NO. OF FORMAT CARDS =       1
                 NO. OF OBSERVATIONS =     791
                 NO. OF INPUT VARIABLES =      4
                 TOTAL NO. OF VARIABLES =      4
                 SPECIFICATIONS FOR THIS PROBLEM
                      SPEARMAN RANK CORRELATIONS
                      NO TESTS OF SIGNIFICANCE
                      NO COEFFICIENT OF CONCORDANCE
                      DATA IS UNRANKED
                      DATA INPUT FROM CARDS
(15X,F1.0,1X,3F3.0)
                 (15X,F1.0,1X,3F3.0)
K
KSPEARMAN RHOS (BELOW DIAGONAL) AND T-RATIOS (ABOVE DIAGONAL)
K                         1            2            3            4
J
   1               1.000000    15.459890    19.975708    12.513113
   2               0.482179     1.000000     7.735086     6.389291
   3               0.579547     0.265494     1.000000    10.220188
   4               0.406927     0.221799     0.341919     1.000000
DEGREES OF FREEDOM =      789
```

TABLE 222

EV TOTAL ANOVA F-TEST GROUPS=LEVELS 1-3 VARIABLES 1=A 2=B 3=C

3 3 1 92 583 116

NUMBER OF VARIABLES = 3
NUMBER OF GROUPS = 3
NUMBER OF FORMAT CARDS = 1
NUMBER OF INDIVIDUALS IN EACH CELL:
92 583 116

VARIABLE 1

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	92.	4.1196	12.2163	3.4952
2	583.	12.1852	84.8351	9.2106
3	116.	34.3707	663.6797	25.7620
TOTAL	791.	14.5006	234.7000	15.3199

HOMOGENITY OF VARIANCE TEST CHISQ= 442.3005 PROBABILITY= 0.0

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.58839062E 05	29419.53	2.	182.82	0.000001
ERROR	0.12680875E 06	160.92	788.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3
1	1.0000	0.0000	0.0000
2	0.0000	1.0000	0.0000
3	0.0000	0.0000	1.0000

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S			3	2	1
		MEANS	34.371	12.185	4.120
	1	4.120	30.251	8.066	0.0
	2	12.185	22.185	0.0	
	3	34.371	0.0		

R= 3 2

THE MULTIPLIER IS 1.06653

CONSULT TABLE B4, P648 IN WINER

TABLE 222-Continued

VARIABLE 2

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	92.	2.5000	2.0769	1.4412
2	583.	10.2796	51.6554	7.1872
3	116.	29.3362	166.6087	12.9077
TOTAL	791.	12.1694	119.1925	10.9175

HOMOGENITY OF VARIANCE TEST CHISQ= 309.5027 PROBABILITY= 0.0000

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.44868937E 05	22434.47	2.	357.77	0.000001
ERROR	0.49412375E 05	62.71	788.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3
1	1.0000	0.0000	0.0000
2	0.0000	1.0000	0.0000
3	0.0000	0.0000	1.0000

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S		3	2	1
	MEANS	29.336	10.280	2.500
1	2.500	26.836	7.780	0.0
2	10.280	19.057	0.0	
3	29.336	0.0		

R= 3 2

THE MULTIPLIER IS 0.66576

CONSULT TABLE B4, P648 IN WINER

TABLE 222-Continued

VARIABLE 3

GROUP	NUMBER	MEAN	VARIANCE	S.DEV.
1	92.	3.2065	4.5833	2.1409
2	583.	19.3190	206.7610	14.3792
3	116.	26.3362	262.3130	16.1961
TOTAL	791.	13.4741	227.4963	15.0830

HOMOGENITY OF VARIANCE TEST CHISQ= 258.0613 PROBABILITY= 0.0000

ANALYSIS OF VARIANCE

SOURCE	SS	MS	DF	F	P
GROUPS	0.29031500E 05	14515.75	2.	75.79	0.000002
ERROR	0.15091775E 06	191.52	788.		

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS

	1	2	3
1	1.0000	0.0000	0.0000
2	0.0000	1.0000	0.0000
3	0.0000	0.0000	1.0000

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS - SEE WINER PAGE 102

S

		3	2	1
	MEANS	26.336	19.319	3.207
1	3.207	23.130	16.113	0.0
2	19.319	7.017	0.0	
3	26.336	0.0		

THE MULTIPLIER IS $R=3$ 1.16351^{2}

CONSULT TABLE B4, P648 IN WINER

TABLE 223

EV TOTAL PEARSON R 1=LEVEL 2=A 3=B 4=C

NO. OF INDIVIDUALS = 791

NO. OF VARIABLES INPUT = 4

NO. OF VARIABLES GENERATED = 0

TOTAL NO. OF VARIABLES = 4

NFMT = 1 IDKR20 = 0 IPRB = 1

(15X,F1.0,1X,3F3.0)

INPUT FORMAT CARD(S)

(15X,F1.0,1X,3F3.0)

MEANS

	1	2	3	4
1	2.030341	14.500631	12.169405	18.474075

STANDARD DEVIATIONS

	1	2	3	4
1	0.512221	15.329611	10.924434	15.092523

CORRELATIONS

	1	2	3	4
1	1.000000	0.524870	0.650882	0.378846
2	0.524870	1.000000	0.293960	0.229899
3	0.650882	0.293960	1.000000	0.336024
4	0.378846	0.229899	0.336024	1.000000

T-VALUES ASSOCIATED WITH R'S

	1	2	3	4
1	0.0	17.320770	24.082199	11.498550
2	17.320770	0.0	8.638768	6.635388
3	24.082199	8.638768	0.0	10.021326
4	11.498550	6.635388	10.021326	0.0

PROBABILITIES OF T'S

	1	2	3	4
1	0.0	0.0	0.0	0.000000
2	0.0	0.0	0.000000	0.000000
3	0.0	0.000000	0.0	0.000000
4	0.000000	0.000000	0.000000	0.0